FIG. 1

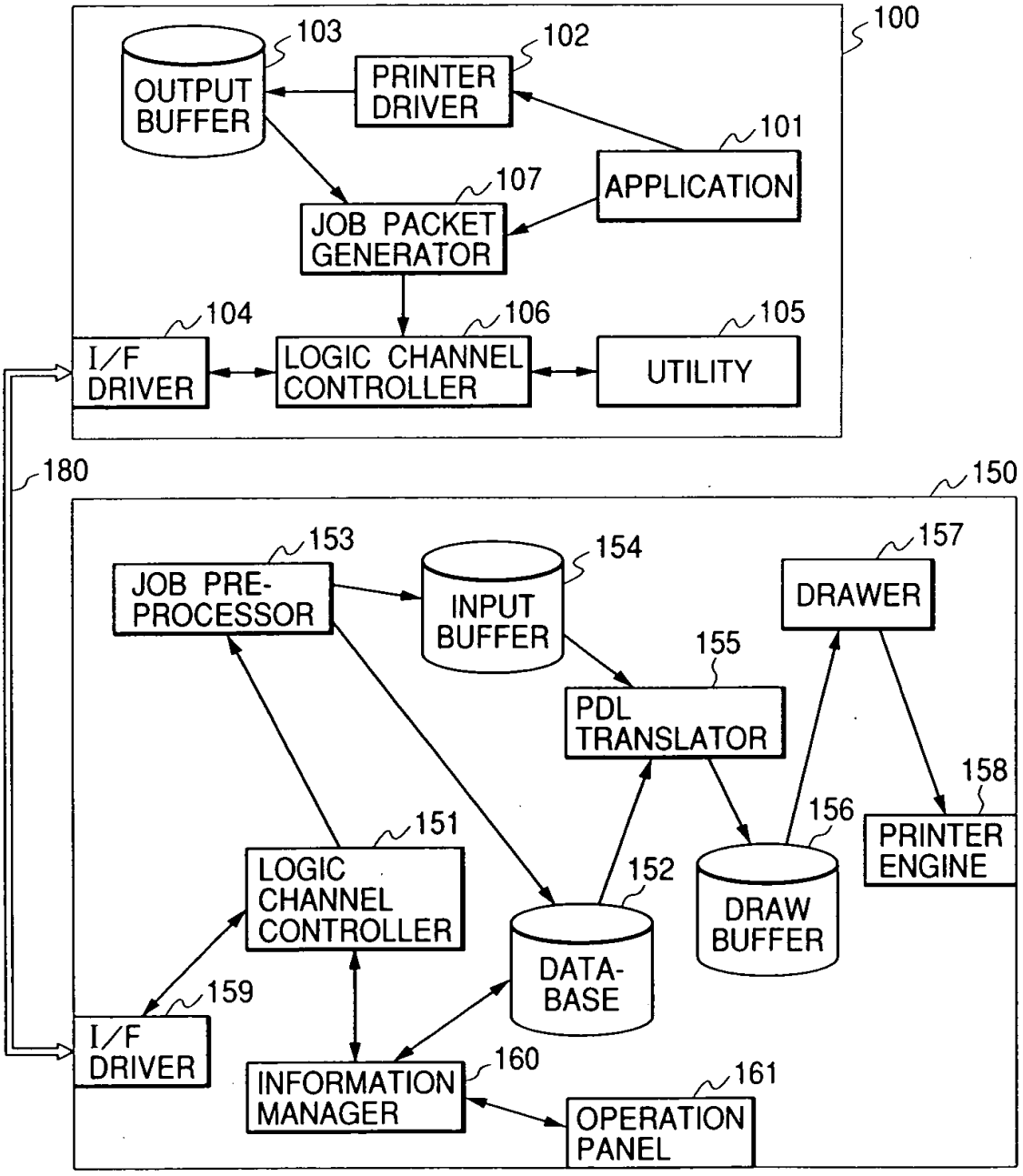

100
103
OUTPUT BUFFER
102
PRINTER DRIVER
101
APPLICATION
107
JOB PACKET GENERATOR
104
I/F DRIVER
106
LOGIC CHANNEL CONTROLLER
105
UTILITY
180
150
153
JOB PRE-PROCESSOR
154
INPUT BUFFER
157
DRAWER
155
PDL TRANSLATOR
158
PRINTER ENGINE
156
DRAW BUFFER
151
LOGIC CHANNEL CONTROLLER
152
DATA-BASE
159
I/F DRIVER
160
INFORMATION MANAGER
161
OPERATION PANEL

FIG. 2

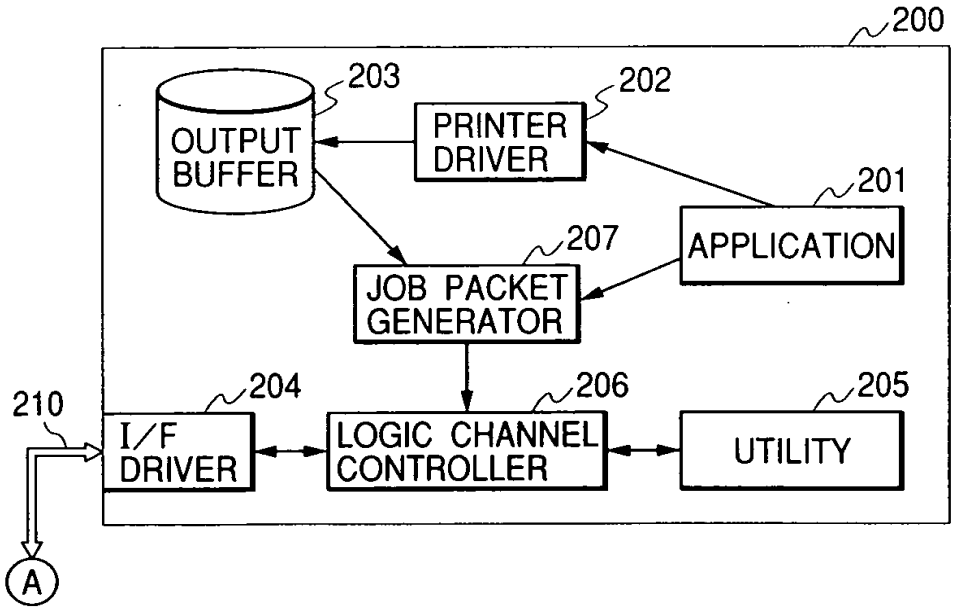

200
203
OUTPUT BUFFER
202
PRINTER DRIVER
201
APPLICATION
207
JOB PACKET GENERATOR
210
204
I/F DRIVER
206
LOGIC CHANNEL CONTROLLER
205
UTILITY
A

FIG. 3

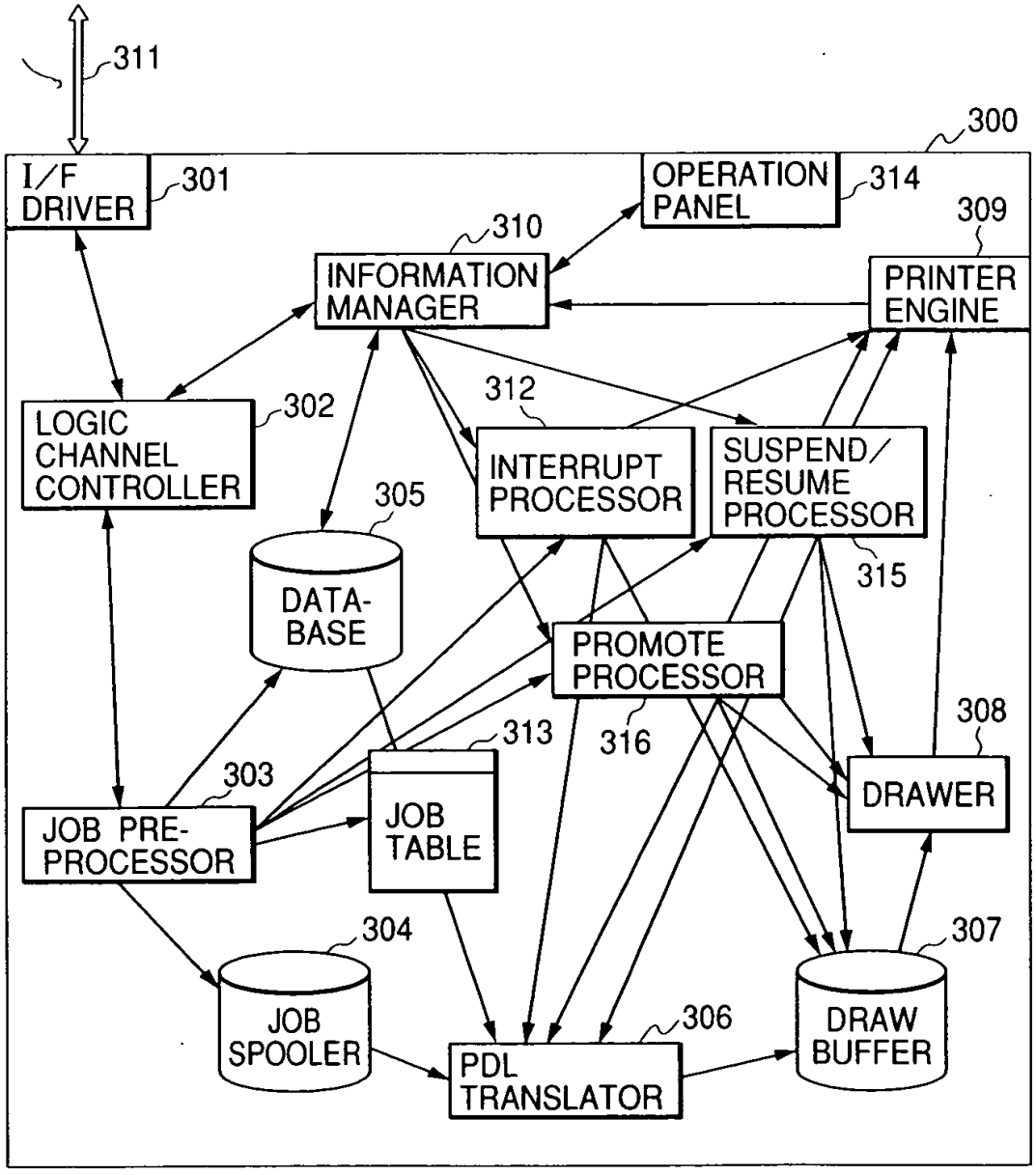

311
300
I/F DRIVER
301
OPERATION PANEL
314
309
310
INFORMATION MANAGER
PRINTER ENGINE
LOGIC CHANNEL CONTROLLER
302
312
INTERRUPT PROCESSOR
SUSPEND/ RESUME PROCESSOR
305
DATA-BASE
315
PROMOTE PROCESSOR
308
313
316
303
JOB PRE-PROCESSOR
JOB TABLE
DRAWER
304
307
JOB SPOOLER
306
PDL TRANSLATOR
DRAW BUFFER

FIG. 4

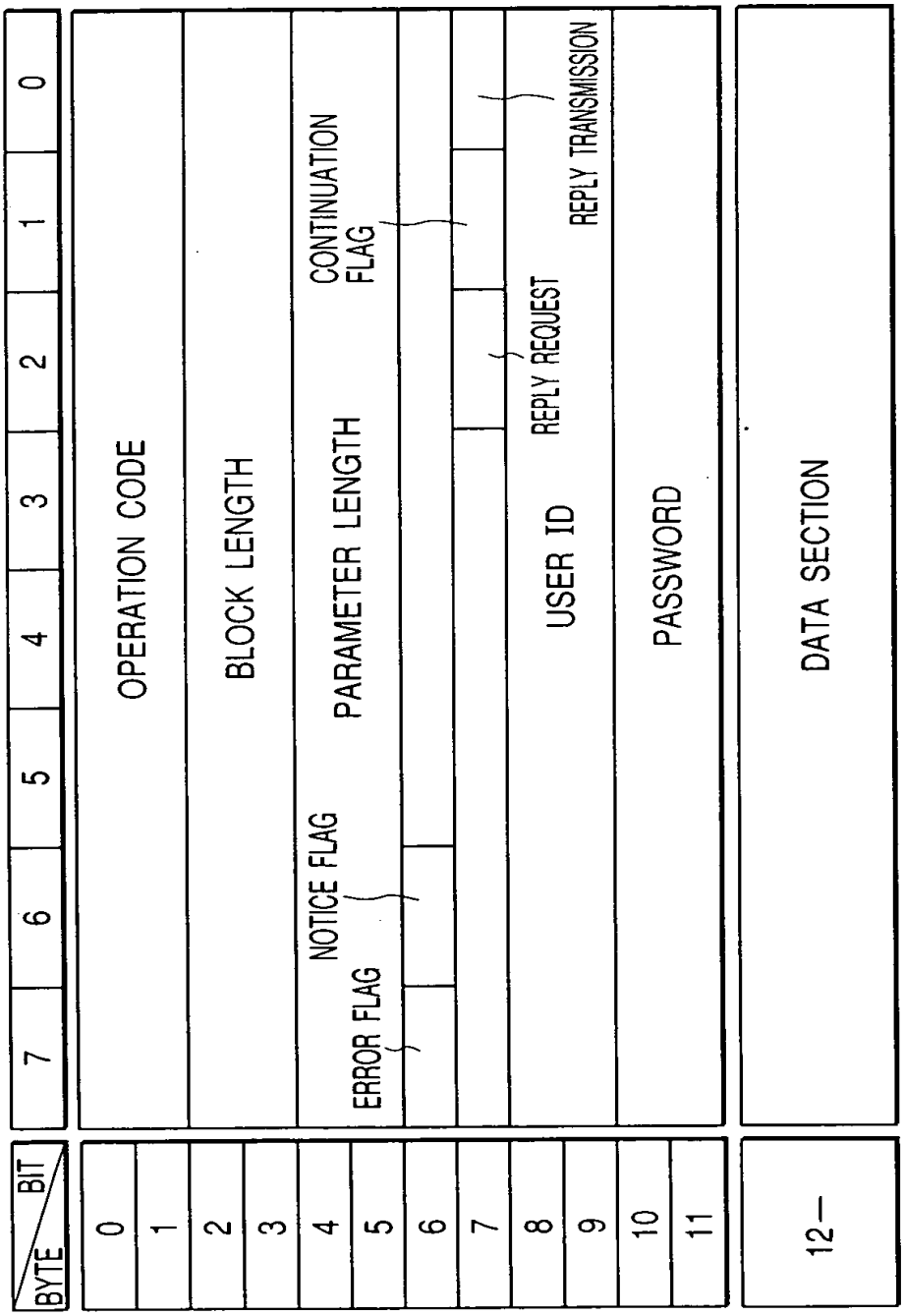

BYTE
BIT
7
6
5
4
3
2
1
0
0
1
2
3
4
5
6
7
8
9
10
11
12
OPERATION CODE
BLOCK LENGTH
NOTICE FLAG
ERROR FLAG
PARAMETER LENGTH
CONTINUATION FLAG
USER ID
REPLY REQUEST
REPLY TRANSMISSION
PASSWORD
DATA SECTION

FIG. 5

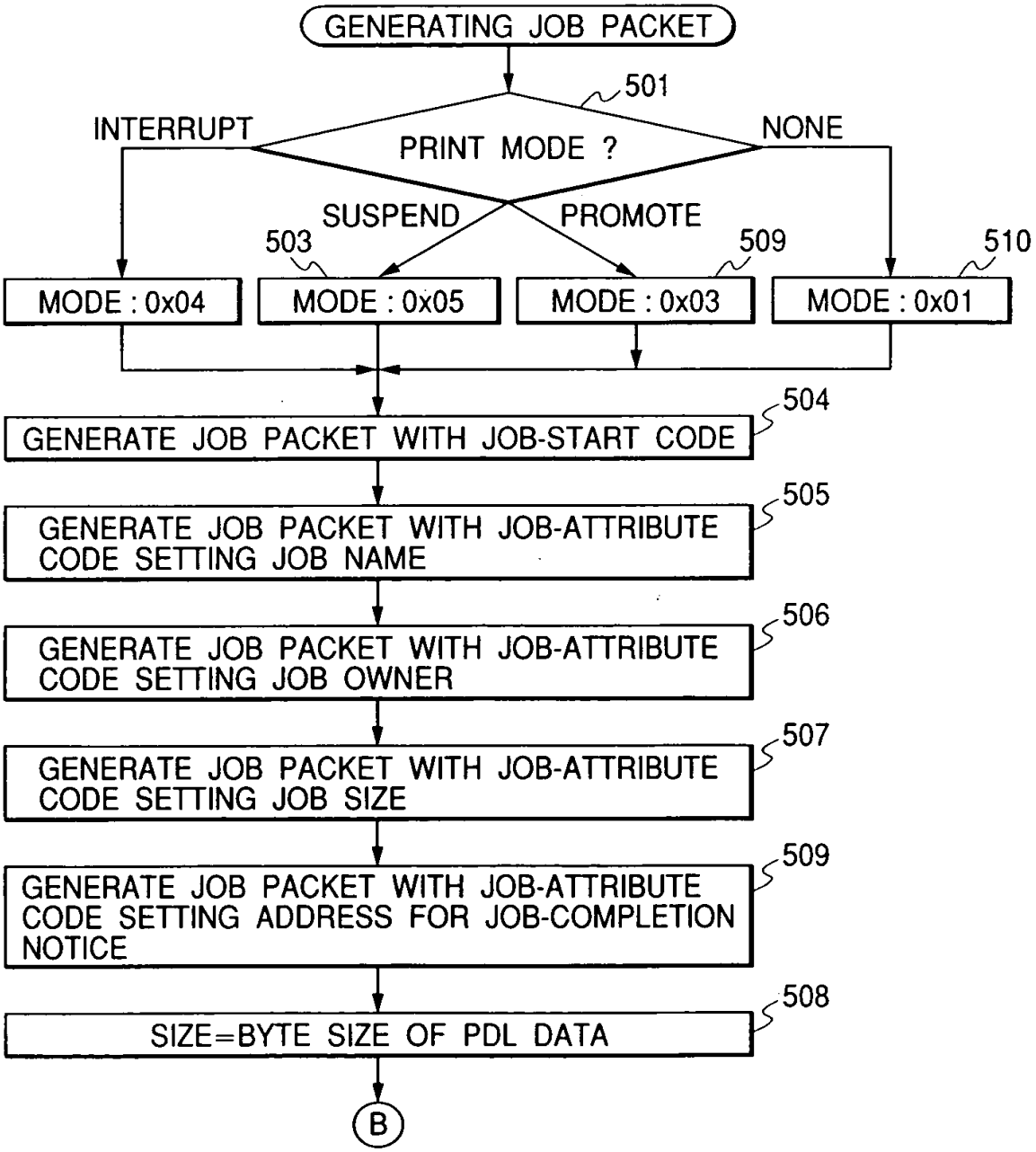

GENERATING JOB PACKET
501
INTERRUPT
PRINT MODE ?
NONE
SUSPEND
PROMOTE
503
509
510
MODE : 0x04
MODE : 0x05
MODE : 0x03
MODE : 0x01
504
GENERATE JOB PACKET WITH JOB-START CODE
505
GENERATE JOB PACKET WITH JOB-ATTRIBUTE CODE SETTING JOB NAME
506
GENERATE JOB PACKET WITH JOB-ATTRIBUTE CODE SETTING JOB OWNER
507
GENERATE JOB PACKET WITH JOB-ATTRIBUTE CODE SETTING JOB SIZE
509
GENERATE JOB PACKET WITH JOB-ATTRIBUTE CODE SETTING ADDRESS FOR JOB-COMPLETION NOTICE
508
SIZE=BYTE SIZE OF PDL DATA
B

FIG. 6

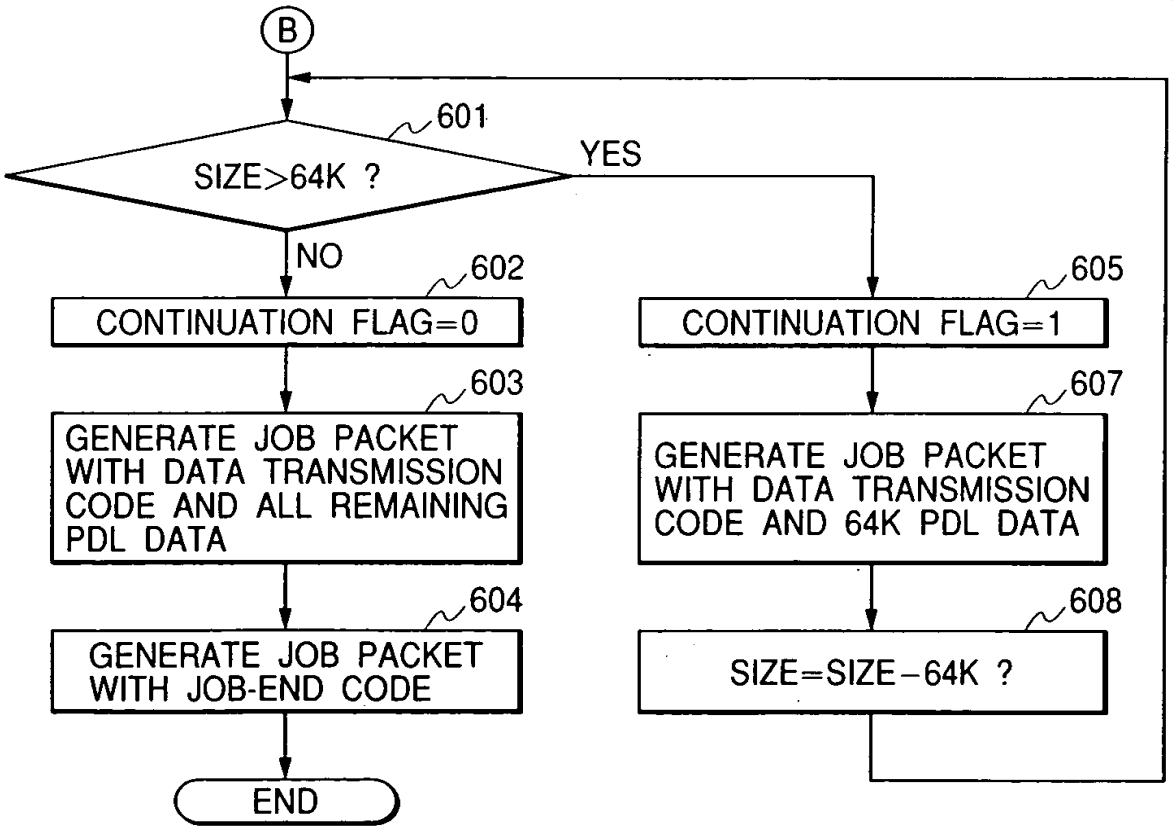

B
601
SIZE>64K ?
YES
NO
602
CONTINUATION FLAG=0
603
GENERATE JOB PACKET WITH DATA TRANSMISSION CODE AND ALL REMAINING PDL DATA
604
GENERATE JOB PACKET WITH JOB-END CODE
END
605
CONTINUATION FLAG=1
607
GENERATE JOB PACKET WITH DATA TRANSMISSION CODE AND 64K PDL DATA
608
SIZE=SIZE-64K ?

FIG. 7

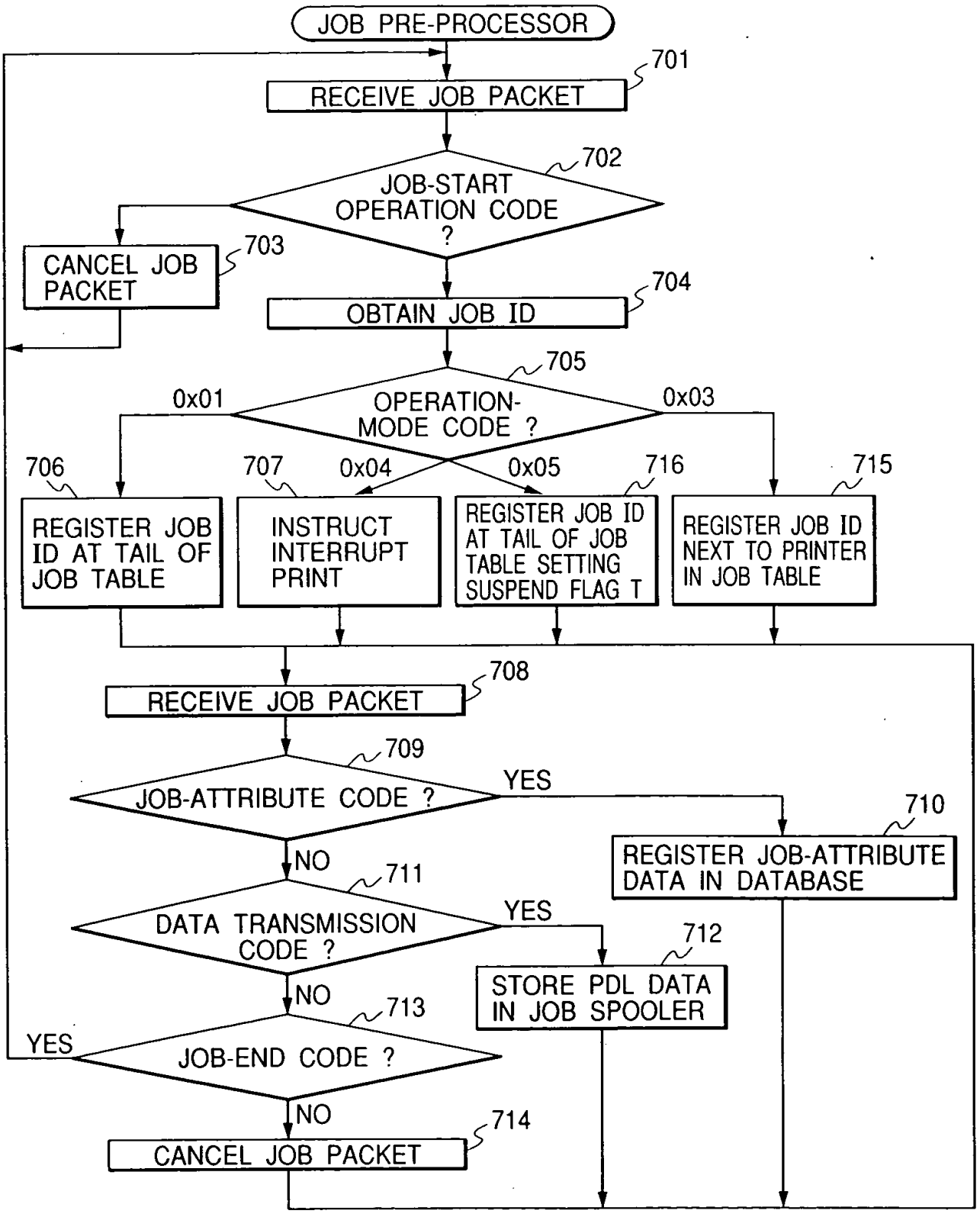

JOB PRE-PROCESSOR
701
RECEIVE JOB PACKET
702
JOB-START OPERATION CODE ?
703
CANCEL JOB PACKET
704
OBTAIN JOB ID
705
OPERATION-MODE CODE ?
0x01
0x03
0x04
0x05
706
REGISTER JOB ID AT TAIL OF JOB TABLE
707
INSTRUCT INTERRUPT PRINT
716
REGISTER JOB ID AT TAIL OF JOB TABLE SETTING SUSPEND FLAG T
715
REGISTER JOB ID NEXT TO PRINTER IN JOB TABLE
708
RECEIVE JOB PACKET
709
JOB-ATTRIBUTE CODE ?
YES
NO
710
REGISTER JOB-ATTRIBUTE DATA IN DATABASE
711
DATA TRANSMISSION CODE ?
YES
NO
712
STORE PDL DATA IN JOB SPOOLER
713
JOB-END CODE ?
YES
NO
714
CANCEL JOB PACKET

FIG. 8

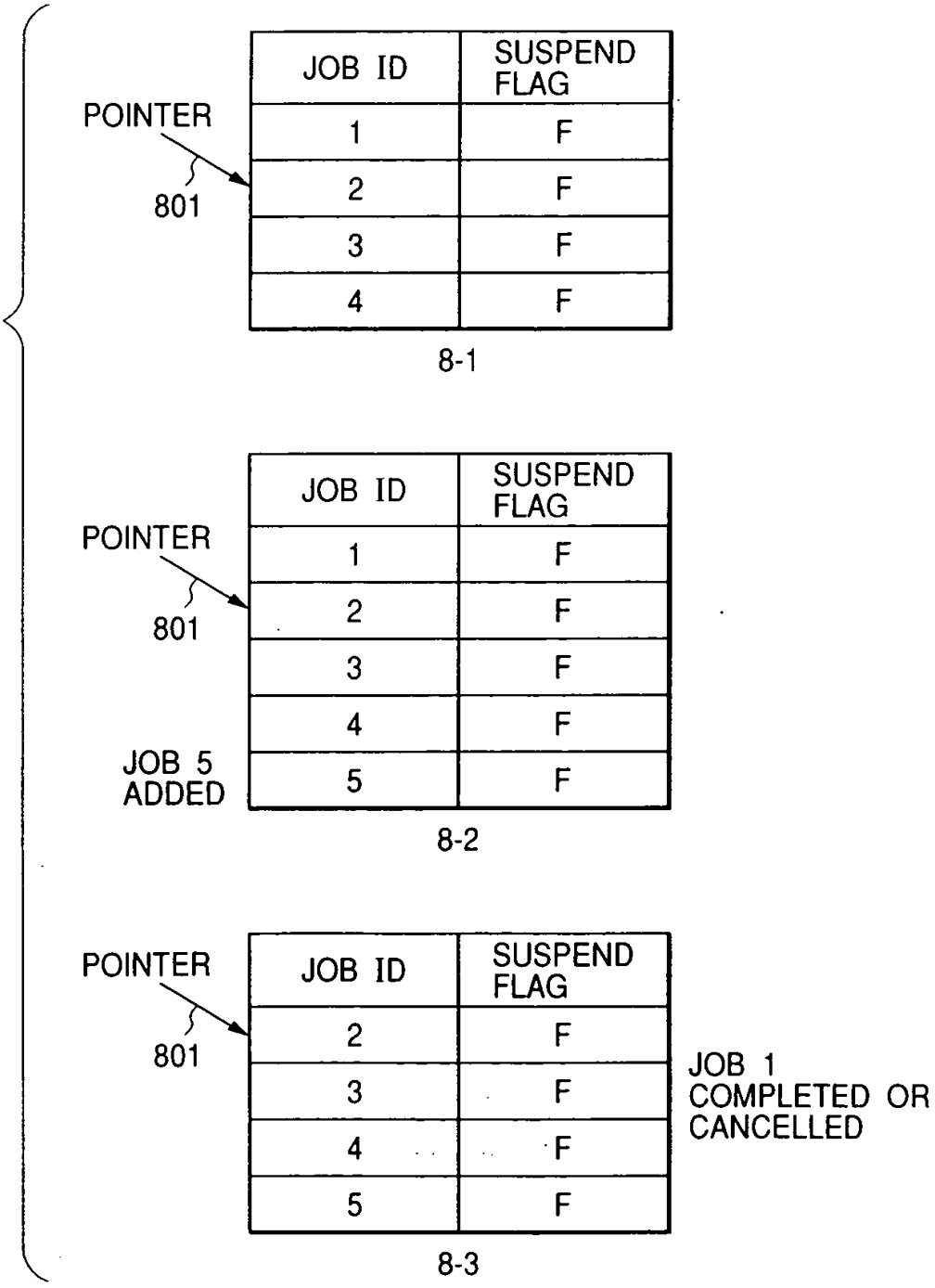

POINTER
801
JOB ID
SUSPEND FLAG
1
F
2
F
3
F
4
F
8-1
POINTER
801
JOB ID
SUSPEND FLAG
1
F
2
F
3
F
4
F
JOB 5 ADDED
5
F
8-2
POINTER
801
JOB ID
SUSPEND FLAG
2
F
3
F
4
F
5
F
JOB 1 COMPLETED OR CANCELLED
8-3

FIG. 9

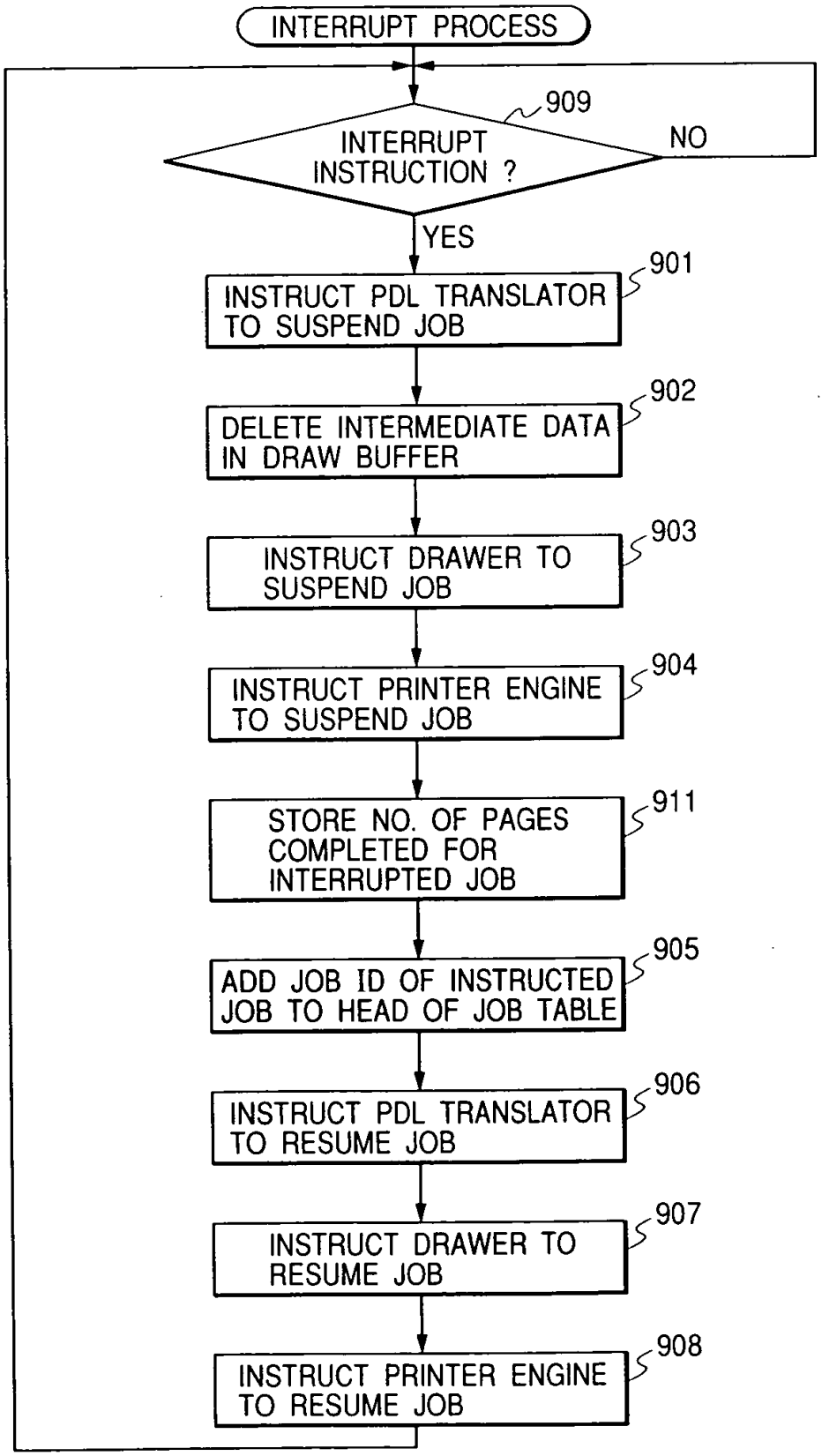

INTERRUPT PROCESS
909
INTERRUPT INSTRUCTION ?
NO
YES
901
INSTRUCT PDL TRANSLATOR TO SUSPEND JOB
902
DELETE INTERMEDIATE DATA IN DRAW BUFFER
903
INSTRUCT DRAWER TO SUSPEND JOB
904
INSTRUCT PRINTER ENGINE TO SUSPEND JOB
911
STORE NO. OF PAGES COMPLETED FOR INTERRUPTED JOB
905
ADD JOB ID OF INSTRUCTED JOB TO HEAD OF JOB TABLE
906
INSTRUCT PDL TRANSLATOR TO RESUME JOB
907
INSTRUCT DRAWER TO RESUME JOB
908
INSTRUCT PRINTER ENGINE TO RESUME JOB

FIG. 10

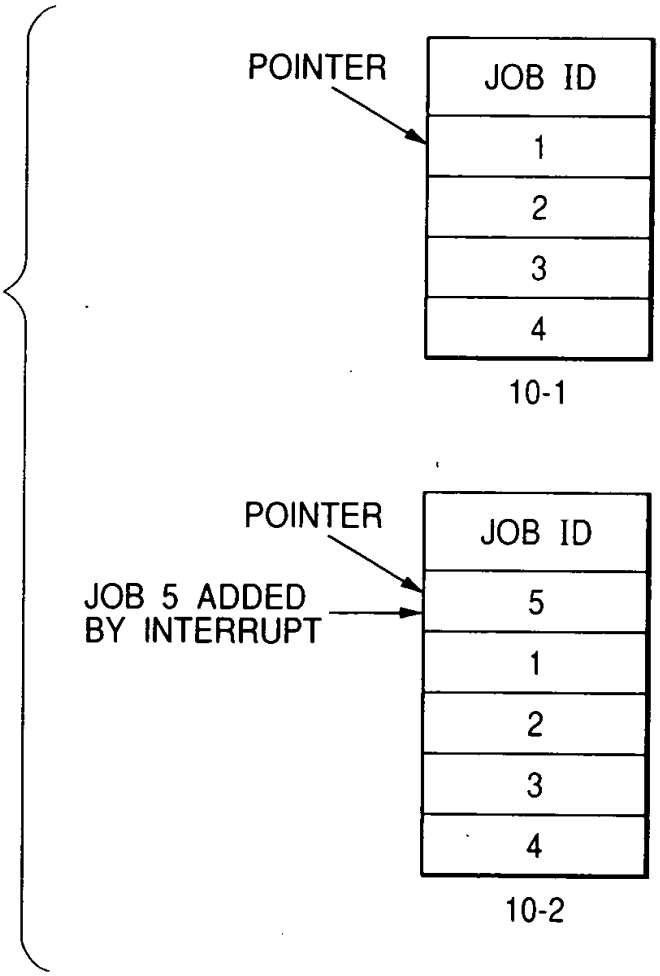

POINTER
JOB ID
1
2
3
4
10-1
POINTER
JOB 5 ADDED
BY INTERRUPT
JOB ID
5
1
2
3
4
10-2

FIG. 11

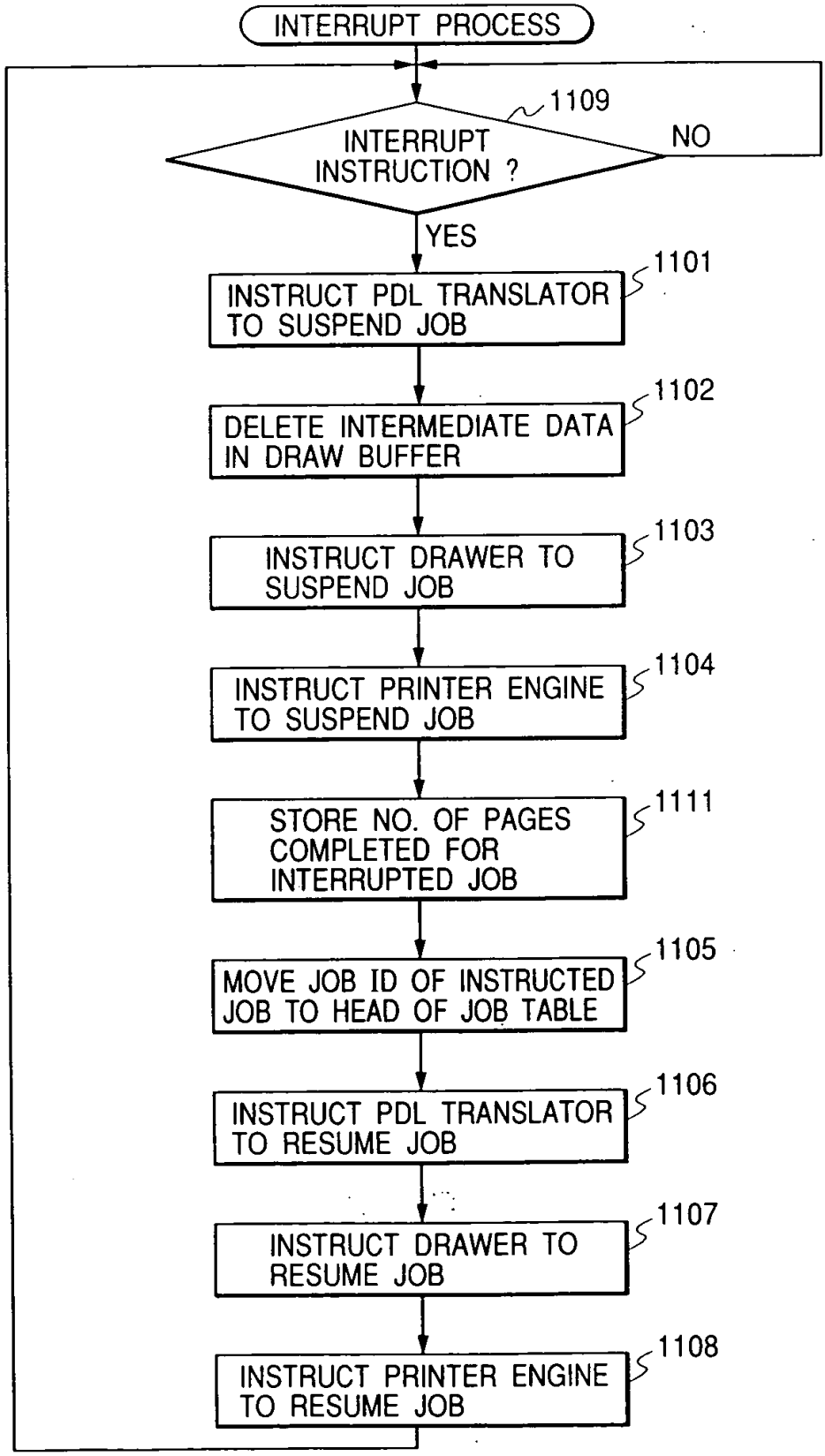

INTERRUPT PROCESS
1109
INTERRUPT INSTRUCTION ?
NO
YES
1101
INSTRUCT PDL TRANSLATOR TO SUSPEND JOB
1102
DELETE INTERMEDIATE DATA IN DRAW BUFFER
1103
INSTRUCT DRAWER TO SUSPEND JOB
1104
INSTRUCT PRINTER ENGINE TO SUSPEND JOB
1111
STORE NO. OF PAGES COMPLETED FOR INTERRUPTED JOB
1105
MOVE JOB ID OF INSTRUCTED JOB TO HEAD OF JOB TABLE
1106
INSTRUCT PDL TRANSLATOR TO RESUME JOB
1107
INSTRUCT DRAWER TO RESUME JOB
1108
INSTRUCT PRINTER ENGINE TO RESUME JOB

FIG. 12

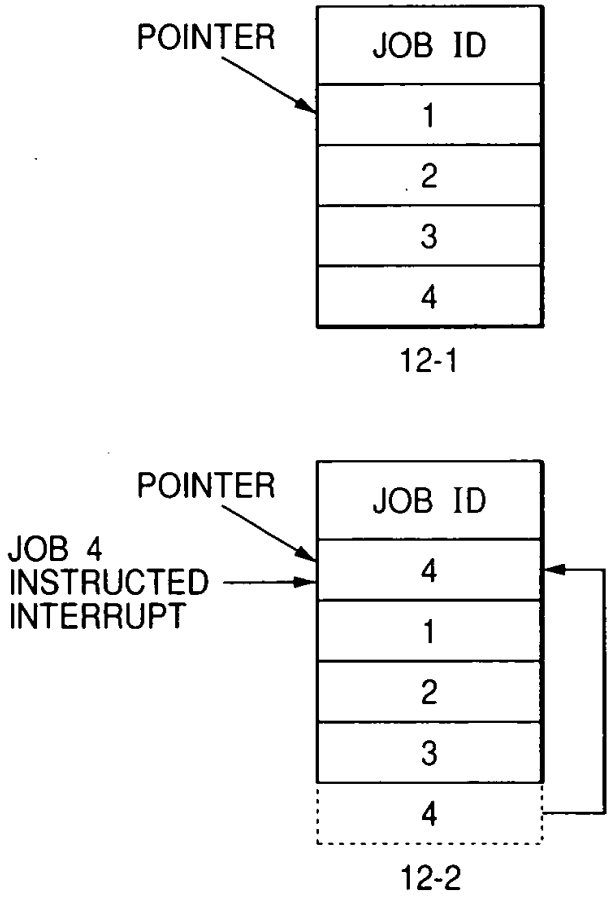

POINTER
JOB ID
1
2
3
4
12-1
POINTER
JOB ID
JOB 4
INSTRUCTED
INTERRUPT
4
1
2
3
4
12-2

FIG. 13

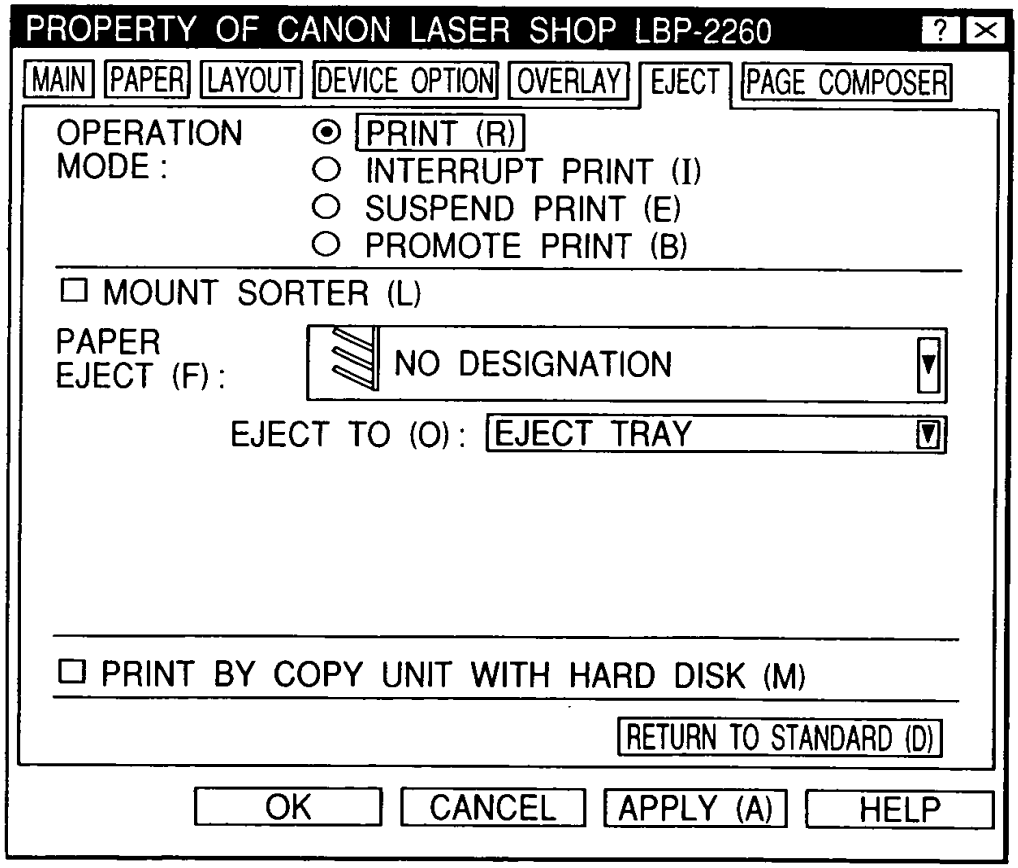

PROPERTY OF CANON LASER SHOP LBP-2260
MAIN
PAPER
LAYOUT
DEVICE OPTION
OVERLAY
EJECT
PAGE COMPOSER
OPERATION MODE :
PRINT (R)
INTERRUPT PRINT (I)
SUSPEND PRINT (E)
PROMOTE PRINT (B)
MOUNT SORTER (L)
PAPER EJECT (F) :
NO DESIGNATION
EJECT TO (O) :
EJECT TRAY
PRINT BY COPY UNIT WITH HARD DISK (M)
RETURN TO STANDARD (D)
OK
CANCEL
APPLY (A)
HELP

FIG. 14

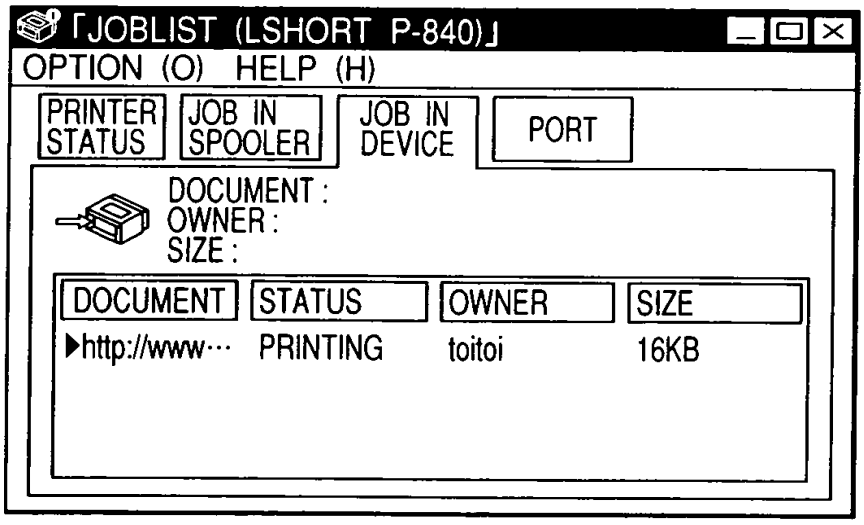

「JOBLIST (LSHORT P-840)」
OPTION (O) HELP (H)
PRINTER STATUS
JOB IN SPOOLER
JOB IN DEVICE
PORT
DOCUMENT :
OWNER :
SIZE :
DOCUMENT
STATUS
OWNER
SIZE
▶http://www··· PRINTING toitoi 16KB

FIG. 15

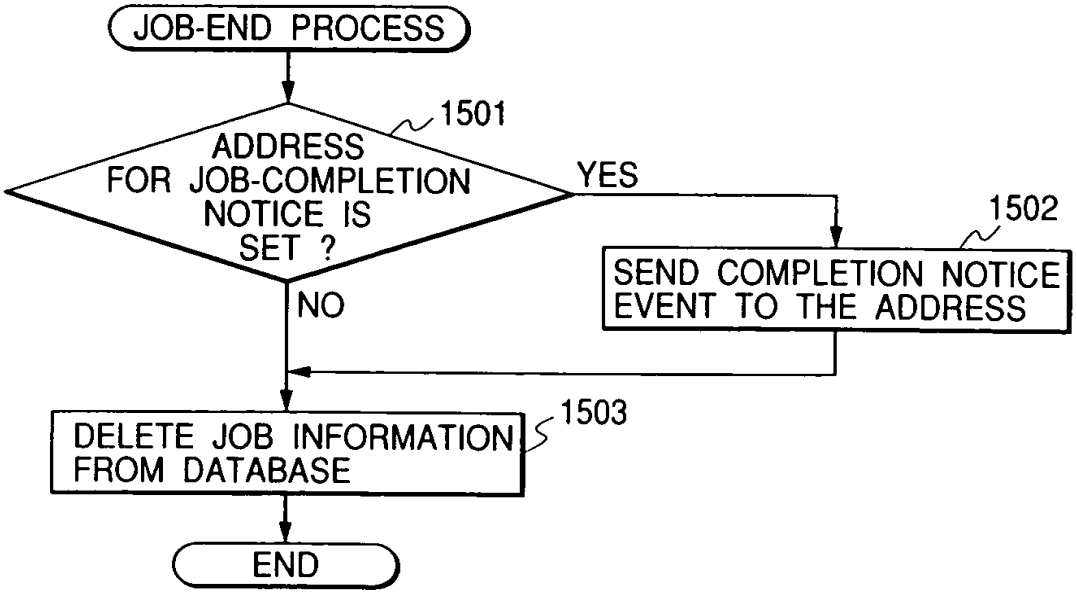

JOB-END PROCESS
1501
ADDRESS FOR JOB-COMPLETION NOTICE IS SET ?
YES
NO
1502
SEND COMPLETION NOTICE EVENT TO THE ADDRESS
1503
DELETE JOB INFORMATION FROM DATABASE
END

FIG. 16

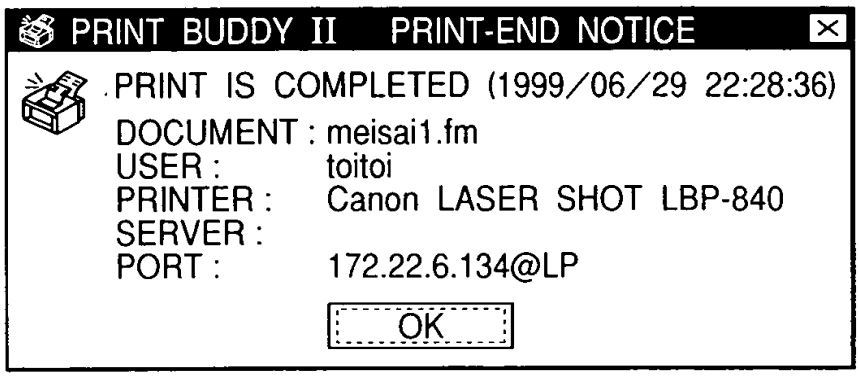

PRINT BUDDY II PRINT-END NOTICE
PRINT IS COMPLETED (1999/06/29 22:28:36)
DOCUMENT : meisai1.fm
USER : toitoi
PRINTER : Canon LASER SHOT LBP-840
SERVER :
PORT : 172.22.6.134@LP
OK

FIG. 17

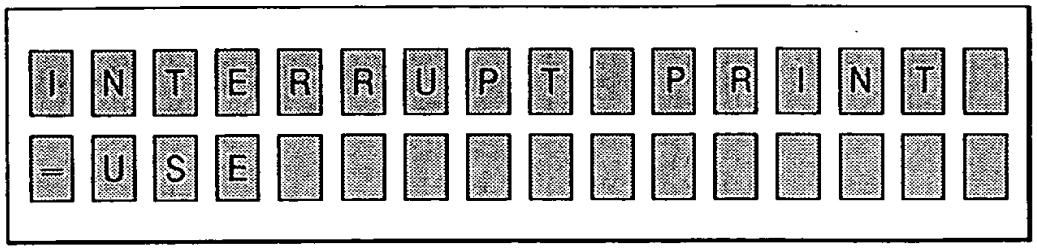

INTERRUPT PRINT
=USE

FIG. 18

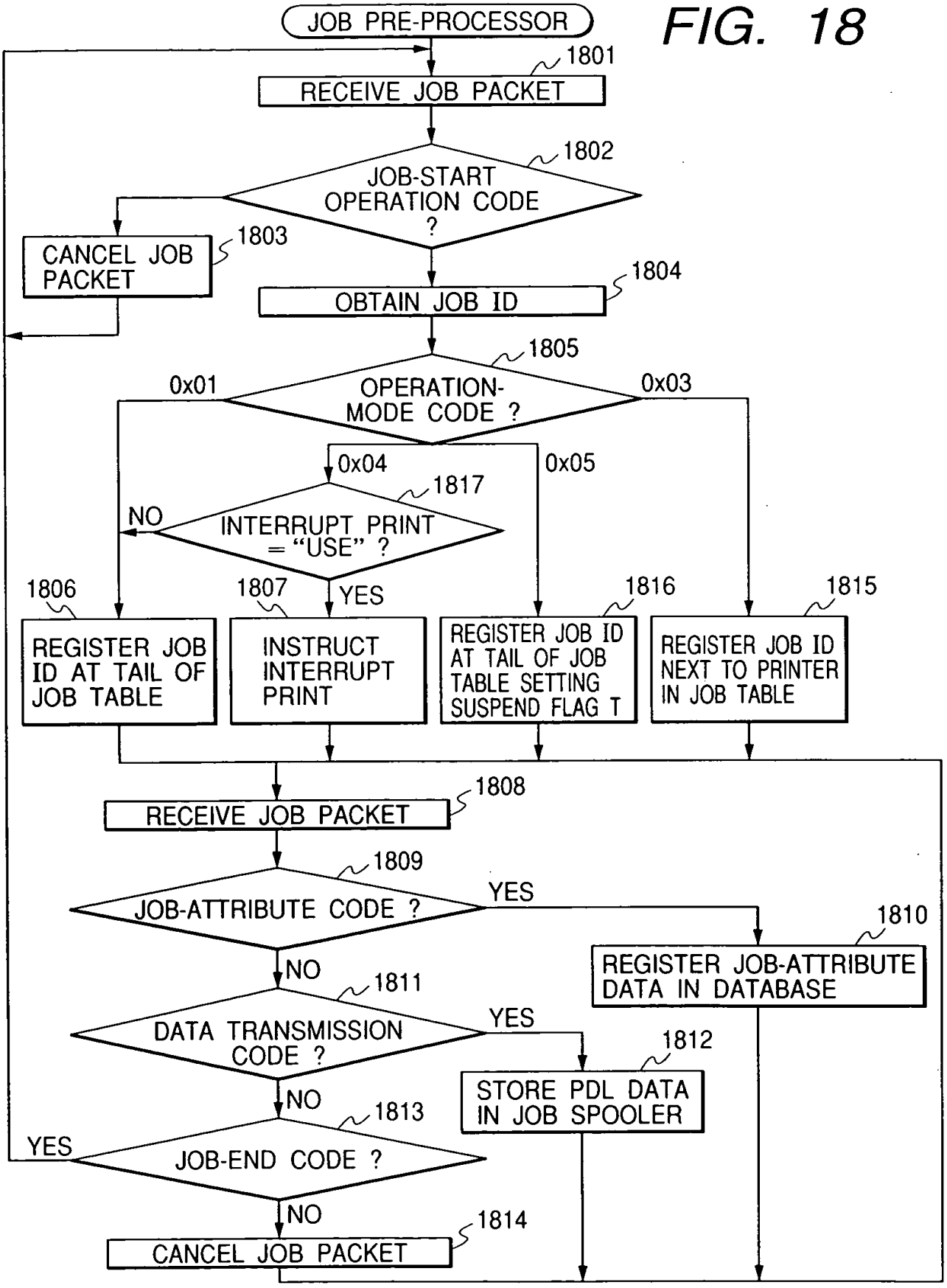

JOB PRE-PROCESSOR
1801
RECEIVE JOB PACKET
1802
JOB-START OPERATION CODE ?
CANCEL JOB PACKET
1803
1804
OBTAIN JOB ID
1805
0x01
OPERATION-MODE CODE ?
0x03
0x04
0x05
1817
NO
INTERRUPT PRINT = "USE" ?
YES
1806
1807
1816
1815
REGISTER JOB ID AT TAIL OF JOB TABLE
INSTRUCT INTERRUPT PRINT
REGISTER JOB ID AT TAIL OF JOB TABLE SETTING SUSPEND FLAG T
REGISTER JOB ID NEXT TO PRINTER IN JOB TABLE
1808
RECEIVE JOB PACKET
1809
JOB-ATTRIBUTE CODE ?
YES
1810
REGISTER JOB-ATTRIBUTE DATA IN DATABASE
NO
1811
DATA TRANSMISSION CODE ?
YES
1812
STORE PDL DATA IN JOB SPOOLER
NO
1813
YES
JOB-END CODE ?
NO
1814
CANCEL JOB PACKET

FIG. 19

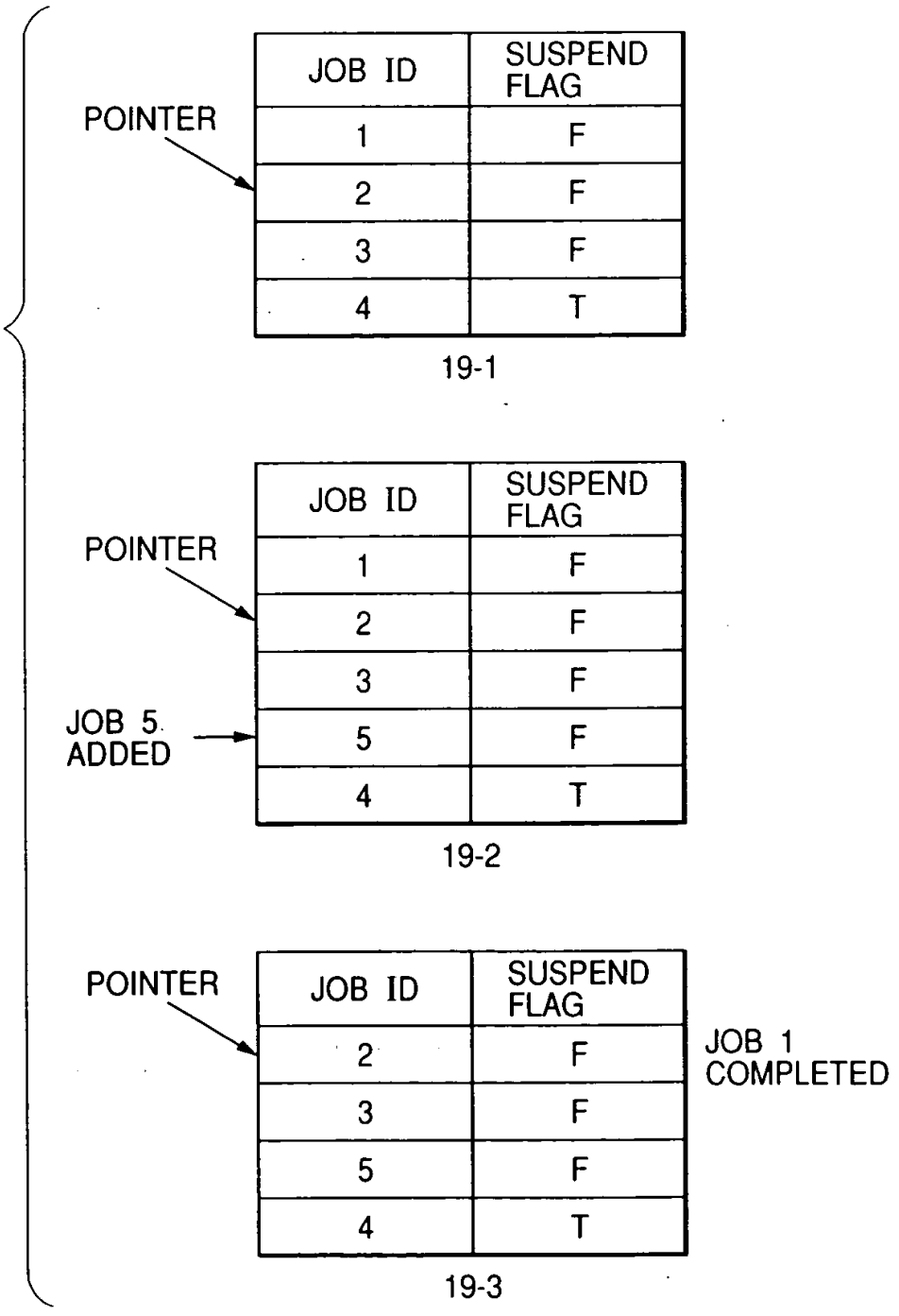

POINTER
JOB ID
SUSPEND FLAG
1
F
2
F
3
F
4
T
19-1
POINTER
JOB ID
SUSPEND FLAG
1
F
2
F
3
F
JOB 5 ADDED
5
F
4
T
19-2
POINTER
JOB ID
SUSPEND FLAG
2
F
JOB 1 COMPLETED
3
F
5
F
4
T
19-3

FIG. 20

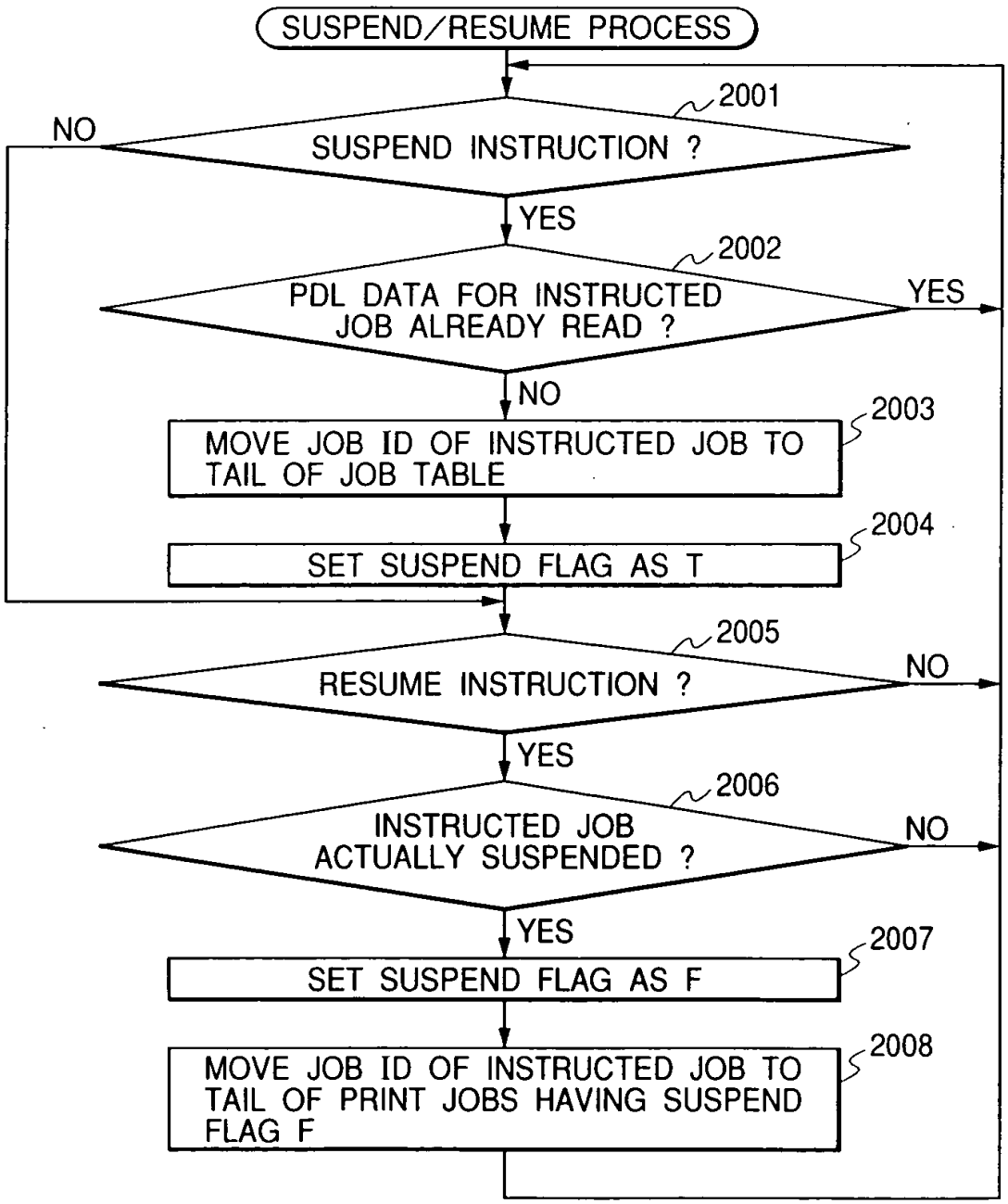

SUSPEND/RESUME PROCESS
2001
SUSPEND INSTRUCTION ?
NO
YES
2002
PDL DATA FOR INSTRUCTED JOB ALREADY READ ?
YES
NO
2003
MOVE JOB ID OF INSTRUCTED JOB TO TAIL OF JOB TABLE
2004
SET SUSPEND FLAG AS T
2005
RESUME INSTRUCTION ?
NO
YES
2006
INSTRUCTED JOB ACTUALLY SUSPENDED ?
NO
YES
2007
SET SUSPEND FLAG AS F
2008
MOVE JOB ID OF INSTRUCTED JOB TO TAIL OF PRINT JOBS HAVING SUSPEND FLAG F

FIG. 21

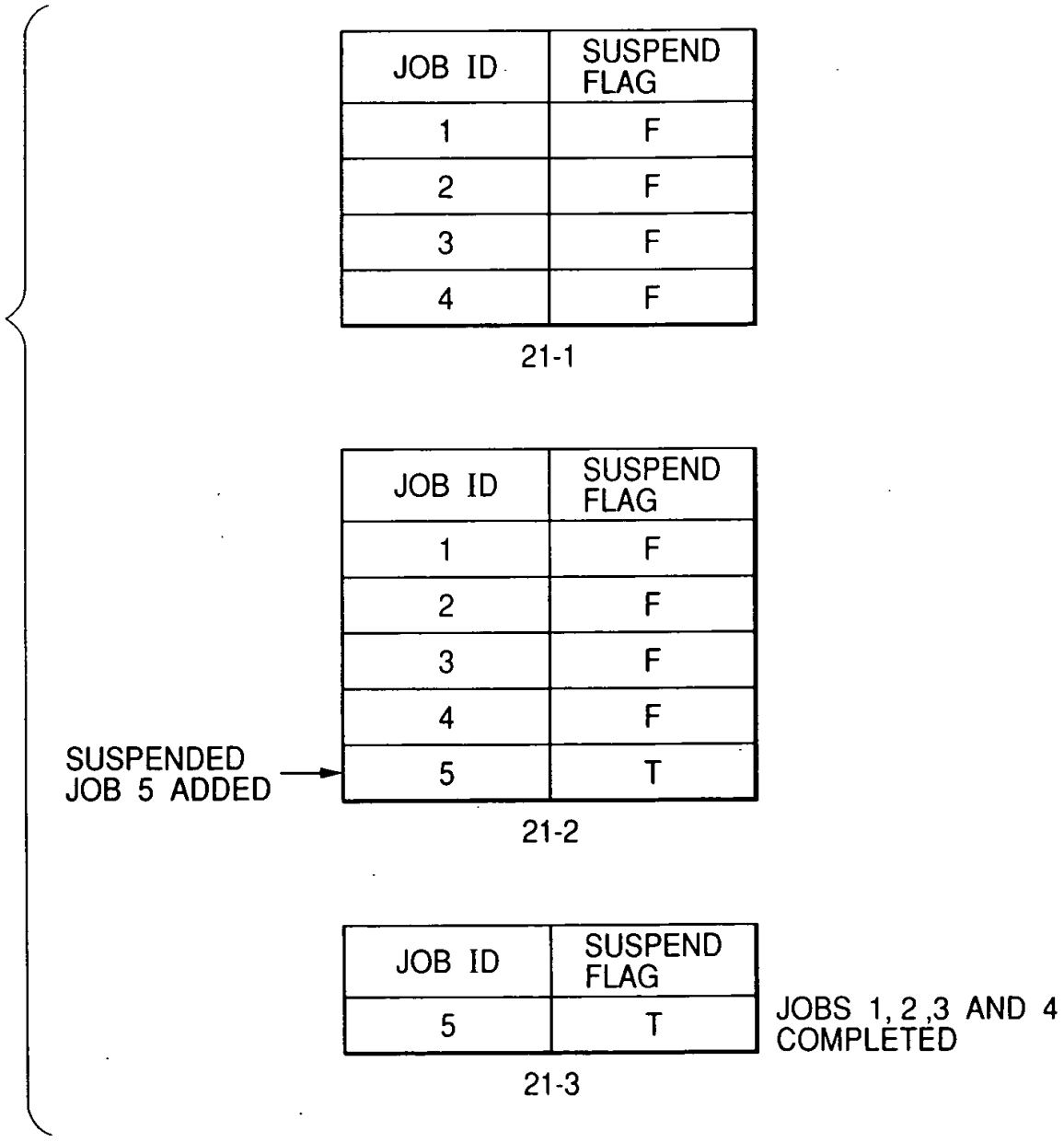

JOB ID
SUSPEND FLAG
1
F
2
F
3
F
4
F
21-1
JOB ID
SUSPEND FLAG
1
F
2
F
3
F
4
F
SUSPENDED JOB 5 ADDED
5
T
21-2
JOB ID
SUSPEND FLAG
5
T
JOBS 1, 2, 3 AND 4 COMPLETED
21-3

FIG. 22

JOB ID	SUSPEND FLAG
1	F
2	F
3	F
4	F

22-1

JOB ID	SUSPEND FLAG
1	F
2	F
3	F
4	F
3	T

JOB 3 CHANGED TO SUSPENDED JOB

22-2

JOB ID	SUSPEND FLAG
1	F
2	F
4	F
3	T

22-3

FIG. 23

JOB ID	SUSPEND FLAG
1	F
2	F
3	T
4	F

23-1

JOB ID	SUSPEND FLAG
2	F
3	T
4	F

23-2

JOB ID	SUSPEND FLAG
2	F
3	F
4	F

23-3

FIG. 24

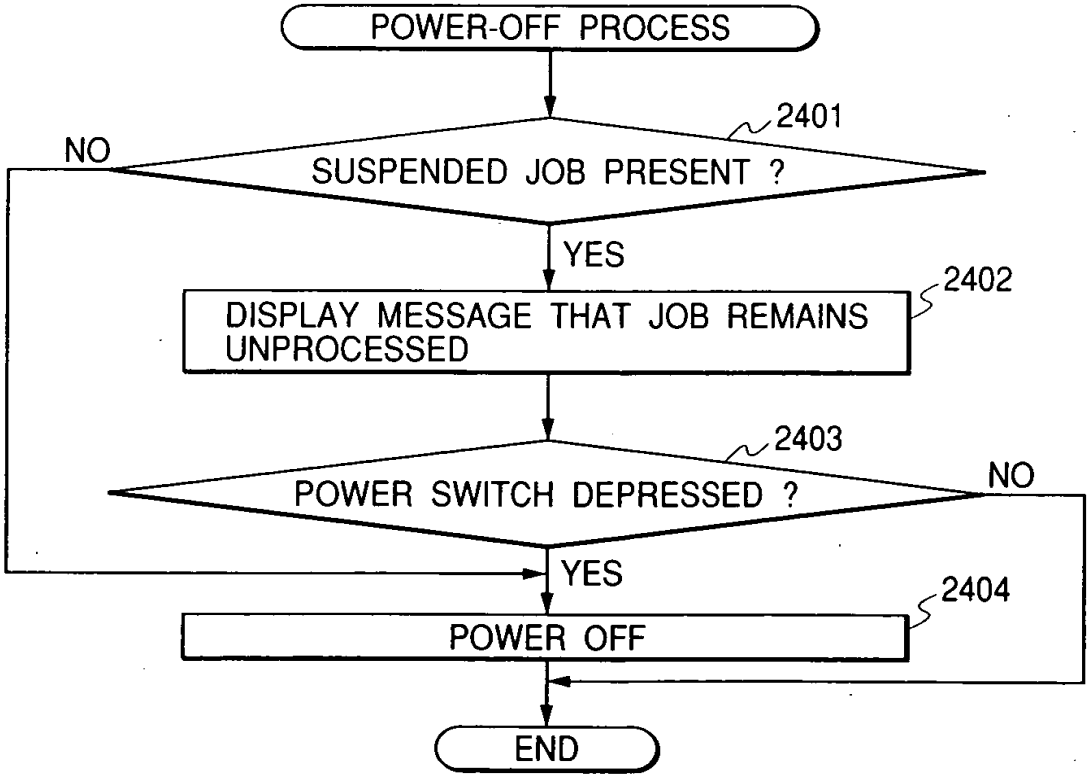

POWER-OFF PROCESS
2401
SUSPENDED JOB PRESENT ?
NO
YES
2402
DISPLAY MESSAGE THAT JOB REMAINS UNPROCESSED
2403
POWER SWITCH DEPRESSED ?
NO
YES
2404
POWER OFF
END

FIG. 25

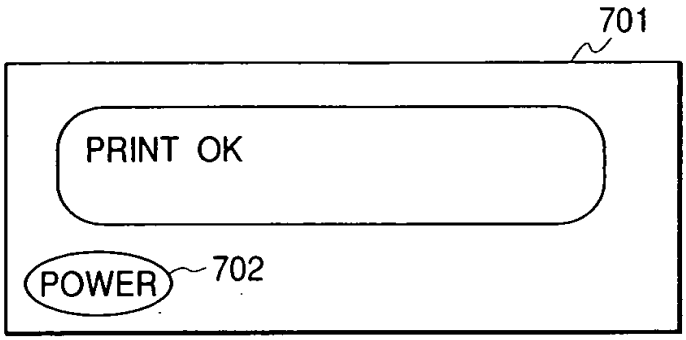

701
PRINT OK
POWER
702

FIG. 26

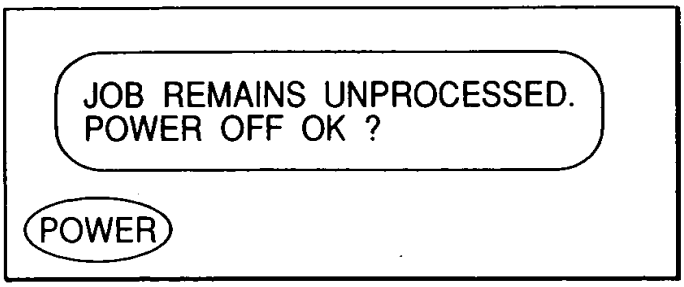

JOB REMAINS UNPROCESSED.
POWER OFF OK ?
POWER

FIG. 27

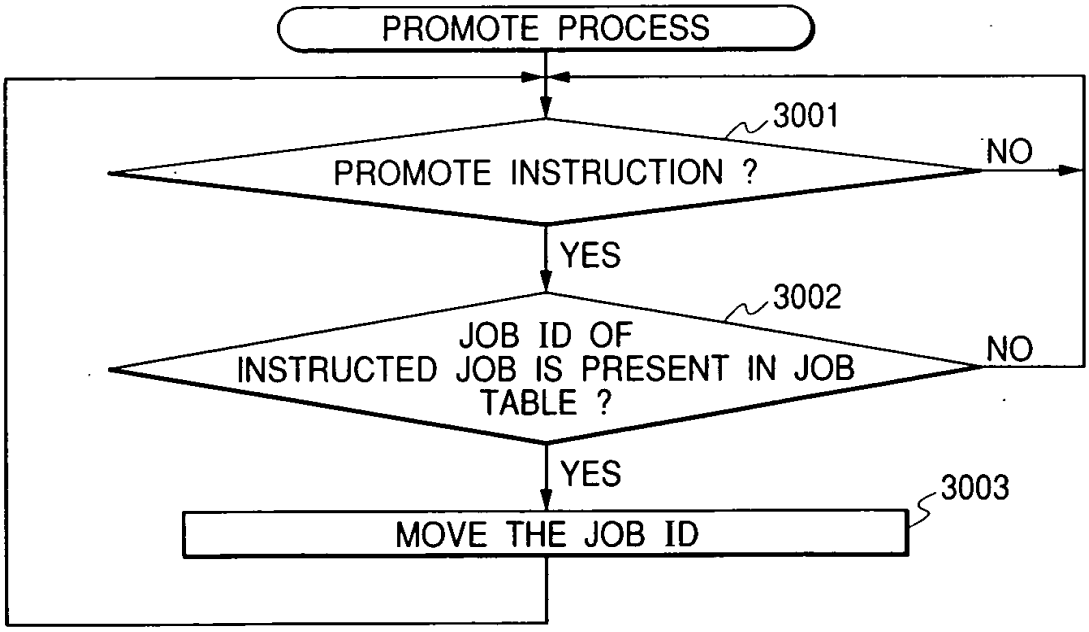

PROMOTE PROCESS
3001
PROMOTE INSTRUCTION ?
NO
YES
3002
JOB ID OF INSTRUCTED JOB IS PRESENT IN JOB TABLE ?
NO
YES
3003
MOVE THE JOB ID

FIG. 28

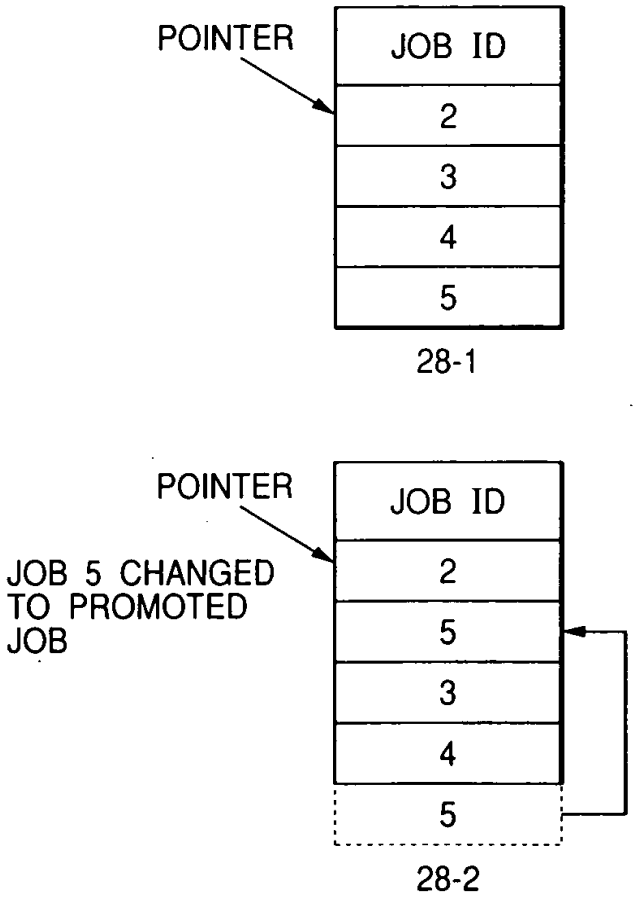

POINTER
JOB ID
2
3
4
5
28-1
POINTER
JOB 5 CHANGED TO PROMOTED JOB
JOB ID
2
5
3
4
5
28-2

FIG. 29

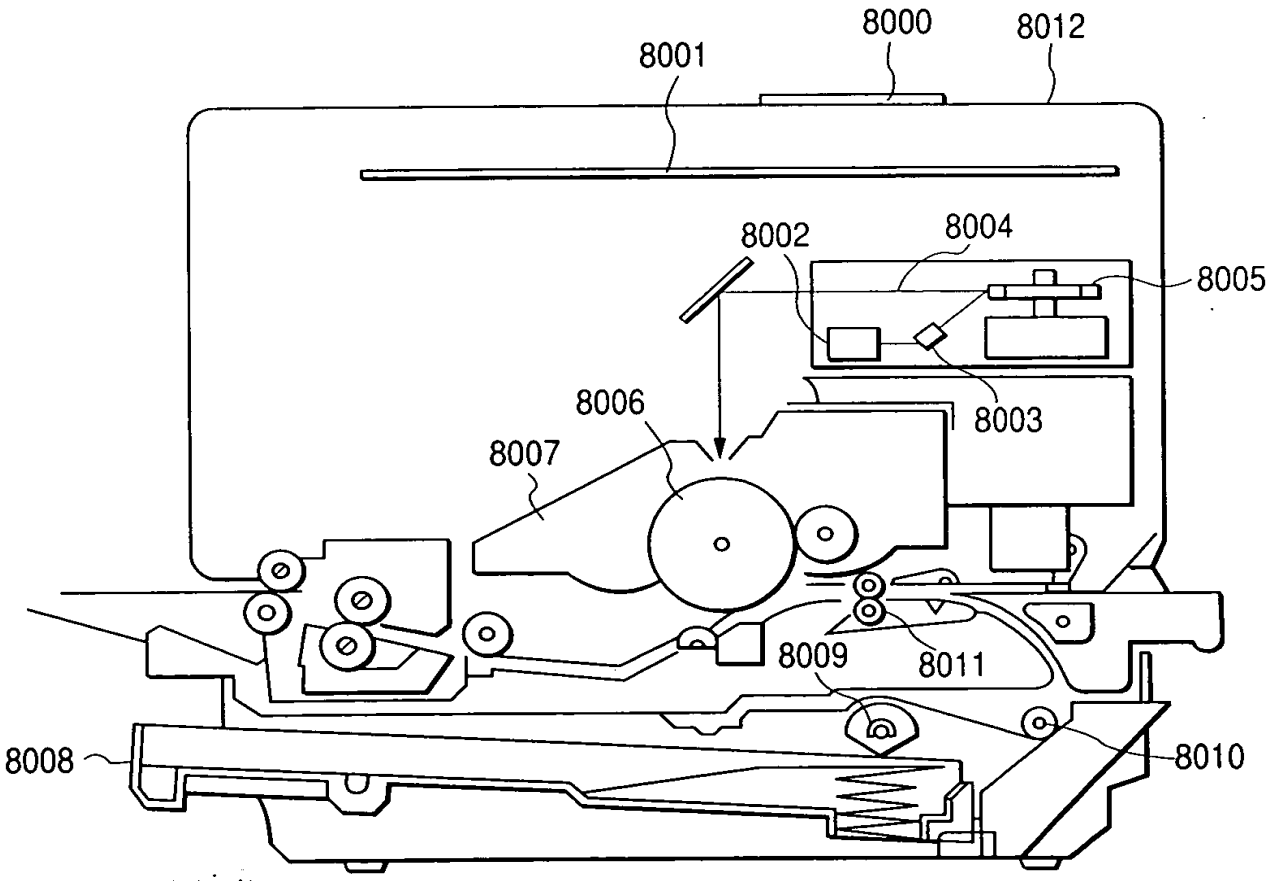

8000
8012
8001
8002
8004
8005
8003
8006
8007
8009
8011
8008
8010

FIG. 30

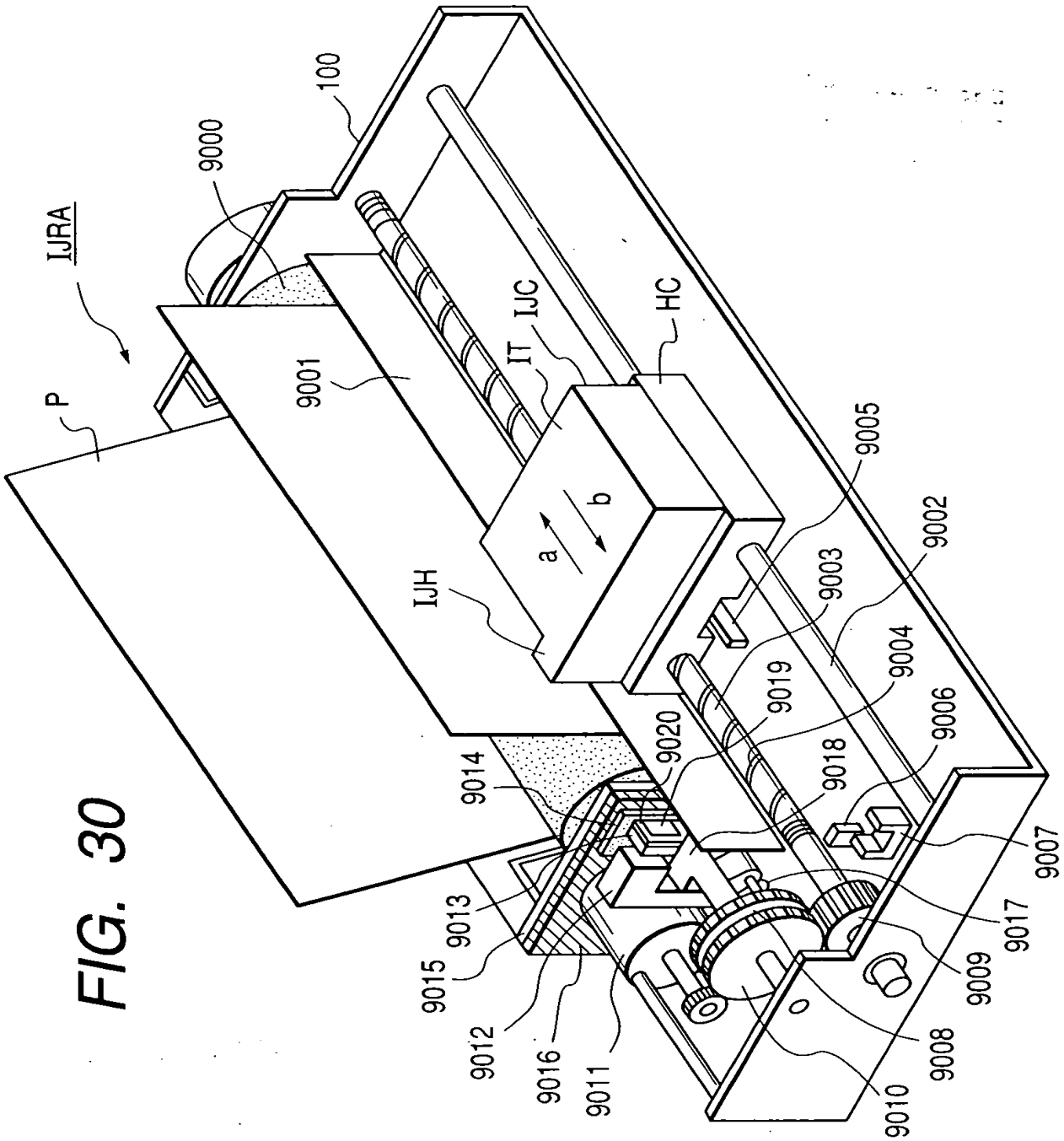

IJRA
P
9000
100
9001
IT
IJC
HC
IJH
a
b
9005
9002
9003
9004
9019
9020
9018
9006
9007
9014
9013
9015
9012
9016
9011
9017
9009
9008
9010

FIG. 31

FOR PRINTER
CONTROL PROGRAM FOR I/F DRIVER
CONTROL PROGRAM FOR LOGIC CHANNEL CONTROLLER
CONTROL PROGRAM FOR JOB PRE-PROCESSOR
CONTROL PROGRAM FOR PDL TRANSLATOR
CONTROL PROGRAM FOR INTERRUPT PROCESSOR
CONTROL PROGRAM FOR SUSPEND/RESUME PROCESSOR
CONTROL PROGRAM FOR PROMOTE PROCESSOR
CONTROL PROGRAM FOR INFORMATION MANAGER
CONTROL PROGRAM FOR DRAWER
CONTROL PROGRAM FOR PRINTER ENGINE
CONTROL PROGRAM FOR OPERATION PANEL
CONTROL PROGRAM FOR FLOWCHART OF FIG. 7
CONTROL PROGRAM FOR FLOWCHART OF FIG. 9
CONTROL PROGRAM FOR FLOWCHART OF FIG. 11
CONTROL PROGRAM FOR FLOWCHART OF FIG. 15
CONTROL PROGRAM FOR FLOWCHART OF FIG. 18
CONTROL PROGRAM FOR FLOWCHART OF FIG. 20
CONTROL PROGRAM FOR FLOWCHART OF FIG. 24
CONTROL PROGRAM FOR FLOWCHART OF FIG. 27
OTHER CONTROL PROGRAM

FOR HOST COMPUTER
CONTROL PROGRAM FOR I/F DRIVER
CONTROL PROGRAM FOR LOGIC CHANNEL CONTROLLER
CONTROL PROGRAM FOR PRINTER DRIVER
CONTROL PROGRAM FOR APPLICATION
CONTROL PROGRAM FOR JOB PACKET GENERATOR
CONTROL PROGRAM FOR UTILITY
CONTROL PROGRAM FOR FLOWCHART OF FIG. 5
CONTROL PROGRAM FOR FLOWCHART OF FIG. 6

FIG. 32

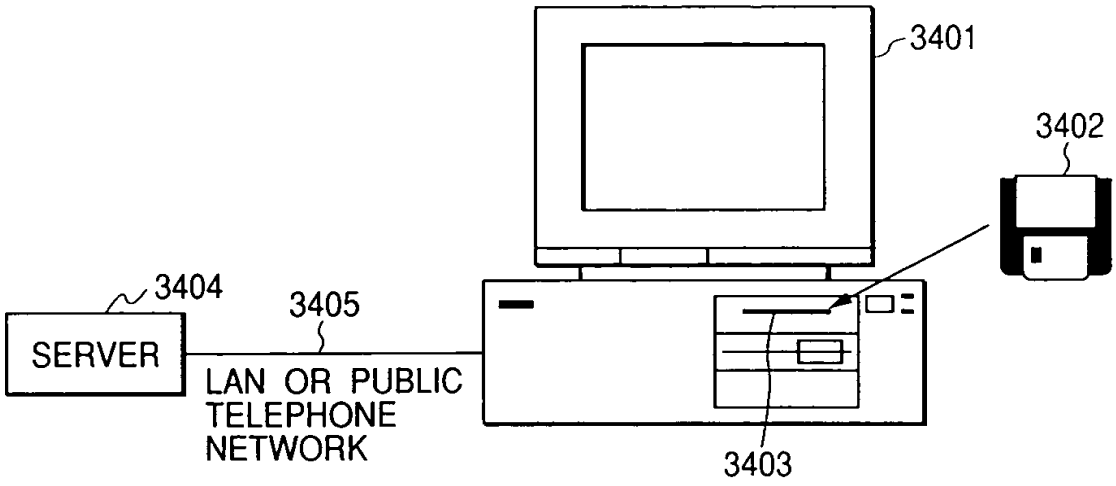

3401
3402
3404
SERVER
3405
LAN OR PUBLIC
TELEPHONE
NETWORK
3403

FIG. 34

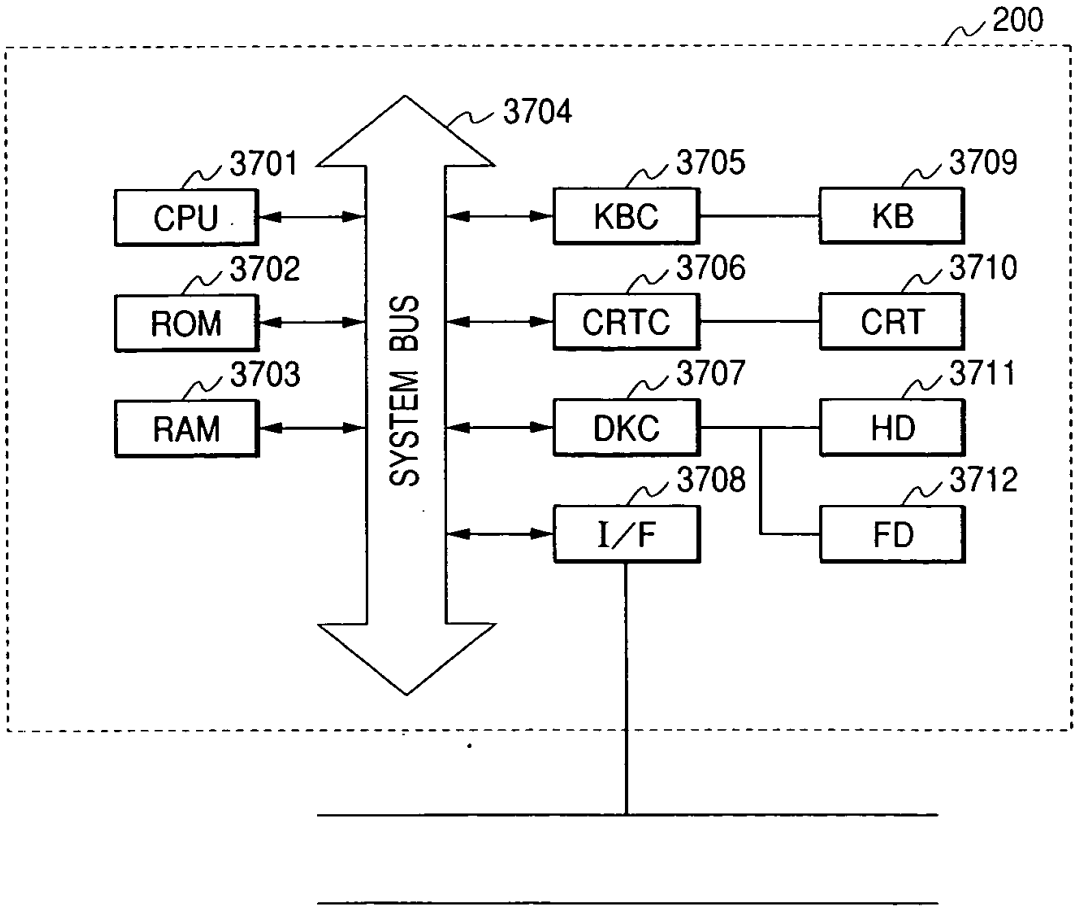

200
3704
SYSTEM BUS
3701
CPU
3702
ROM
3703
RAM
3705
KBC
3706
CRTC
3707
DKC
3708
I/F
3709
KB
3710
CRT
3711
HD
3712
FD

FIG. 33

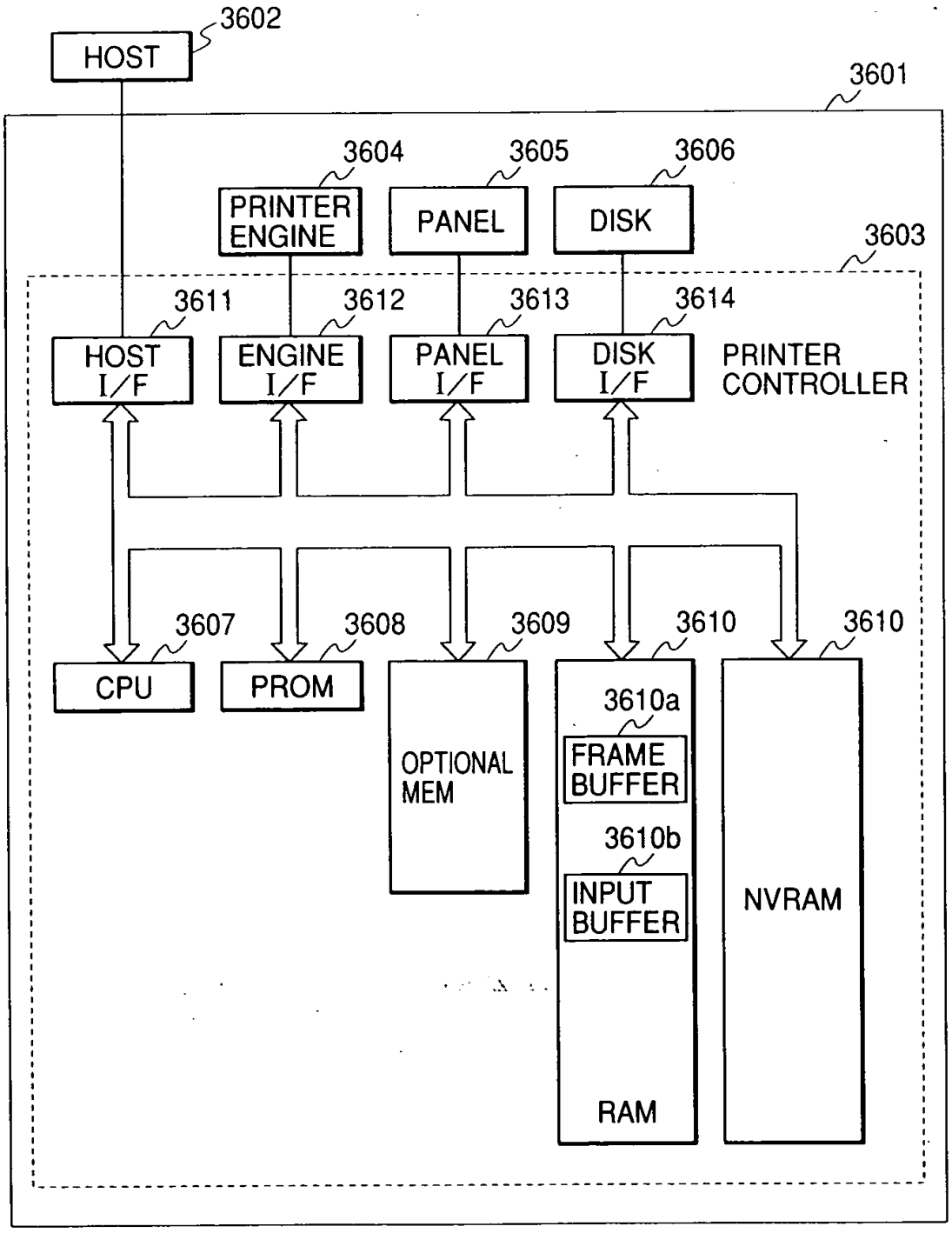

HOST
3602
3601
3604
3605
3606
PRINTER ENGINE
PANEL
DISK
3603
3611
3612
3613
3614
HOST I/F
ENGINE I/F
PANEL I/F
DISK I/F
PRINTER CONTROLLER
3607
3608
3609
3610
3610
CPU
PROM
OPTIONAL MEM
3610a
FRAME BUFFER
3610b
INPUT BUFFER
RAM
NVRAM

FIG. 35

	3501 JOB ID	3502 STATUS	3503 PAGE BUFFER	3504 ANALYSIS INFORMATION	3505 OUTPUT INFORMATION	3506 NETWORK
3507	1	OUTPUTTING	100000		10000	
3508	2	WAITING FOR OUTPUT	180000			111.22.33.44
3509	3	ANALYZING		11000		111.22.33.47

MANAGEMENT TABLE

FIG. 36

3601	3602	3608	3603	3609	3604	3605	3606
100000	RULE		START		END	LINE THICKNESS	100010
3607 CHR	FONT NAME		START		NO. OF CHRS		3610
3611 CHR CODE							
100050	RECTANGLE		START		END	LINE THICKNESS	100060
3612	3613		3614		3615	3616	3617

INTERMEDIATE DATA IN DRAW BUFFER

FIG. 37

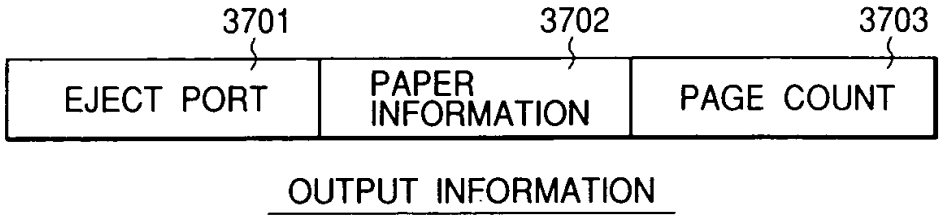

3701
3702
3703
EJECT PORT
PAPER INFORMATION
PAGE COUNT
OUTPUT INFORMATION

FIG. 39

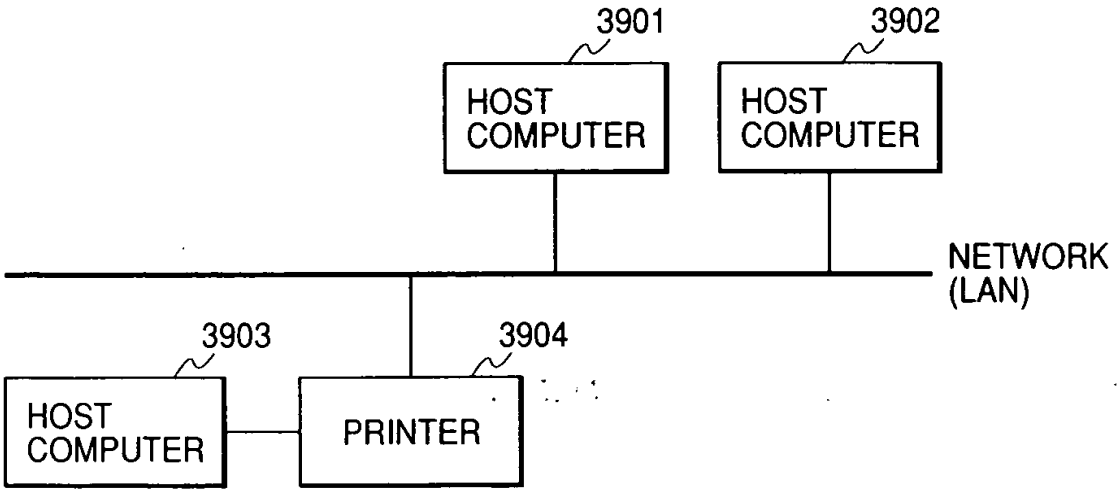

3901
3902
HOST COMPUTER
HOST COMPUTER
NETWORK (LAN)
3903
3904
HOST COMPUTER
PRINTER

FIG. 38

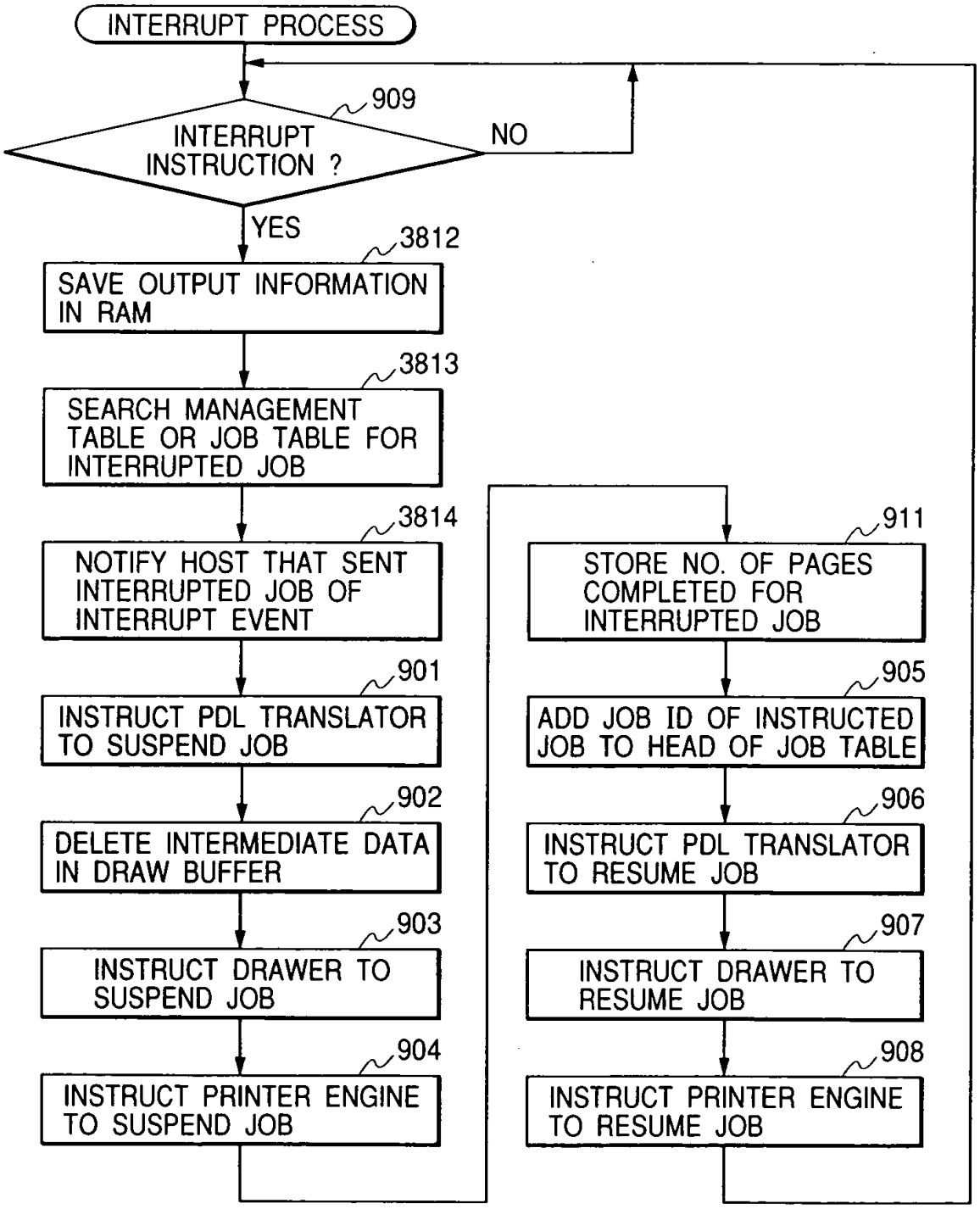

INTERRUPT PROCESS
909
INTERRUPT INSTRUCTION ?
NO
YES
3812
SAVE OUTPUT INFORMATION IN RAM
3813
SEARCH MANAGEMENT TABLE OR JOB TABLE FOR INTERRUPTED JOB
3814
NOTIFY HOST THAT SENT INTERRUPTED JOB OF INTERRUPT EVENT
901
INSTRUCT PDL TRANSLATOR TO SUSPEND JOB
902
DELETE INTERMEDIATE DATA IN DRAW BUFFER
903
INSTRUCT DRAWER TO SUSPEND JOB
904
INSTRUCT PRINTER ENGINE TO SUSPEND JOB
911
STORE NO. OF PAGES COMPLETED FOR INTERRUPTED JOB
905
ADD JOB ID OF INSTRUCTED JOB TO HEAD OF JOB TABLE
906
INSTRUCT PDL TRANSLATOR TO RESUME JOB
907
INSTRUCT DRAWER TO RESUME JOB
908
INSTRUCT PRINTER ENGINE TO RESUME JOB

FIG. 40

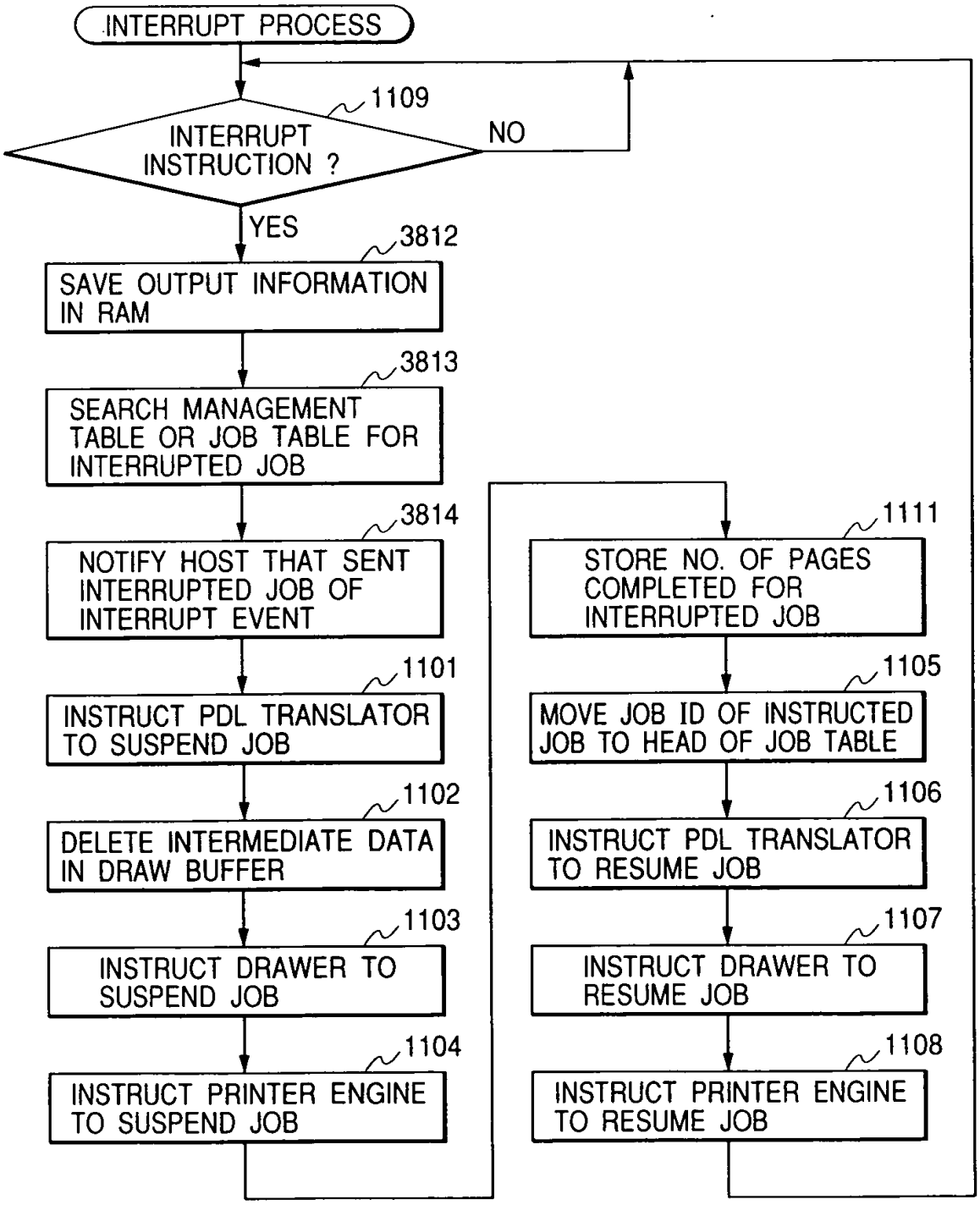

INTERRUPT PROCESS
1109
INTERRUPT INSTRUCTION ?
NO
YES
3812
SAVE OUTPUT INFORMATION IN RAM
3813
SEARCH MANAGEMENT TABLE OR JOB TABLE FOR INTERRUPTED JOB
3814
NOTIFY HOST THAT SENT INTERRUPTED JOB OF INTERRUPT EVENT
1101
INSTRUCT PDL TRANSLATOR TO SUSPEND JOB
1102
DELETE INTERMEDIATE DATA IN DRAW BUFFER
1103
INSTRUCT DRAWER TO SUSPEND JOB
1104
INSTRUCT PRINTER ENGINE TO SUSPEND JOB
1111
STORE NO. OF PAGES COMPLETED FOR INTERRUPTED JOB
1105
MOVE JOB ID OF INSTRUCTED JOB TO HEAD OF JOB TABLE
1106
INSTRUCT PDL TRANSLATOR TO RESUME JOB
1107
INSTRUCT DRAWER TO RESUME JOB
1108
INSTRUCT PRINTER ENGINE TO RESUME JOB

FIG. 41

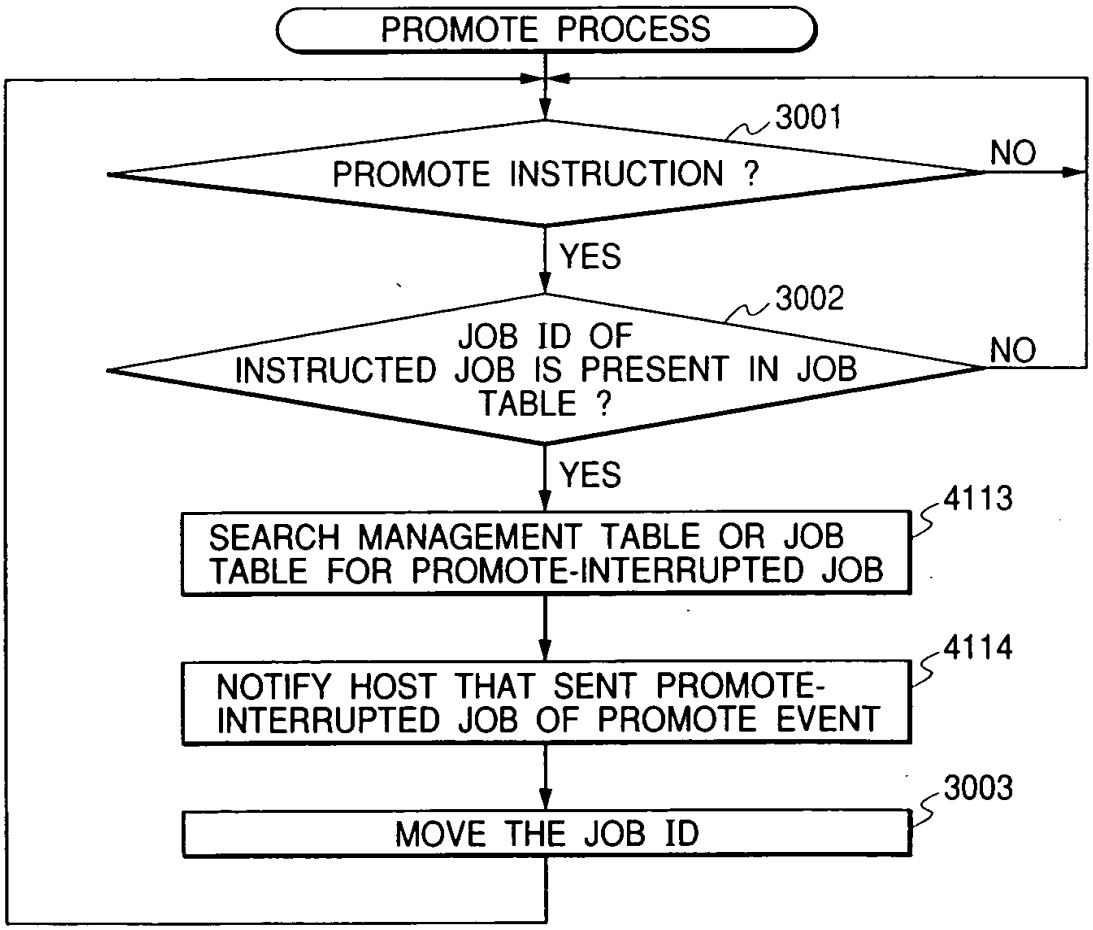

PROMOTE PROCESS
3001
PROMOTE INSTRUCTION ?
NO
YES
3002
JOB ID OF INSTRUCTED JOB IS PRESENT IN JOB TABLE ?
NO
YES
4113
SEARCH MANAGEMENT TABLE OR JOB TABLE FOR PROMOTE-INTERRUPTED JOB
4114
NOTIFY HOST THAT SENT PROMOTE-INTERRUPTED JOB OF PROMOTE EVENT
3003
MOVE THE JOB ID

FIG. 42

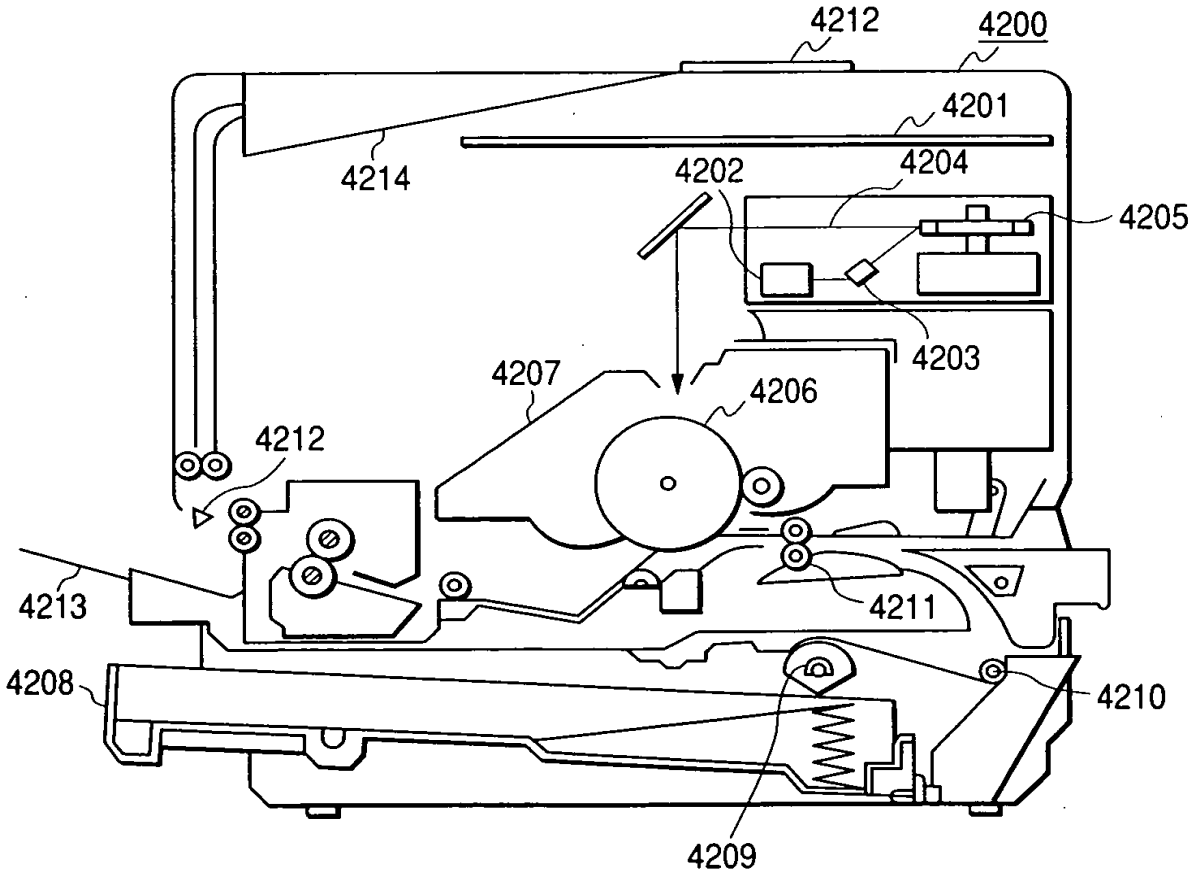

4212
4200
4201
4214
4202
4204
4205
4203
4207
4206
4212
4213
4211
4208
4210
4209

FIG. 43

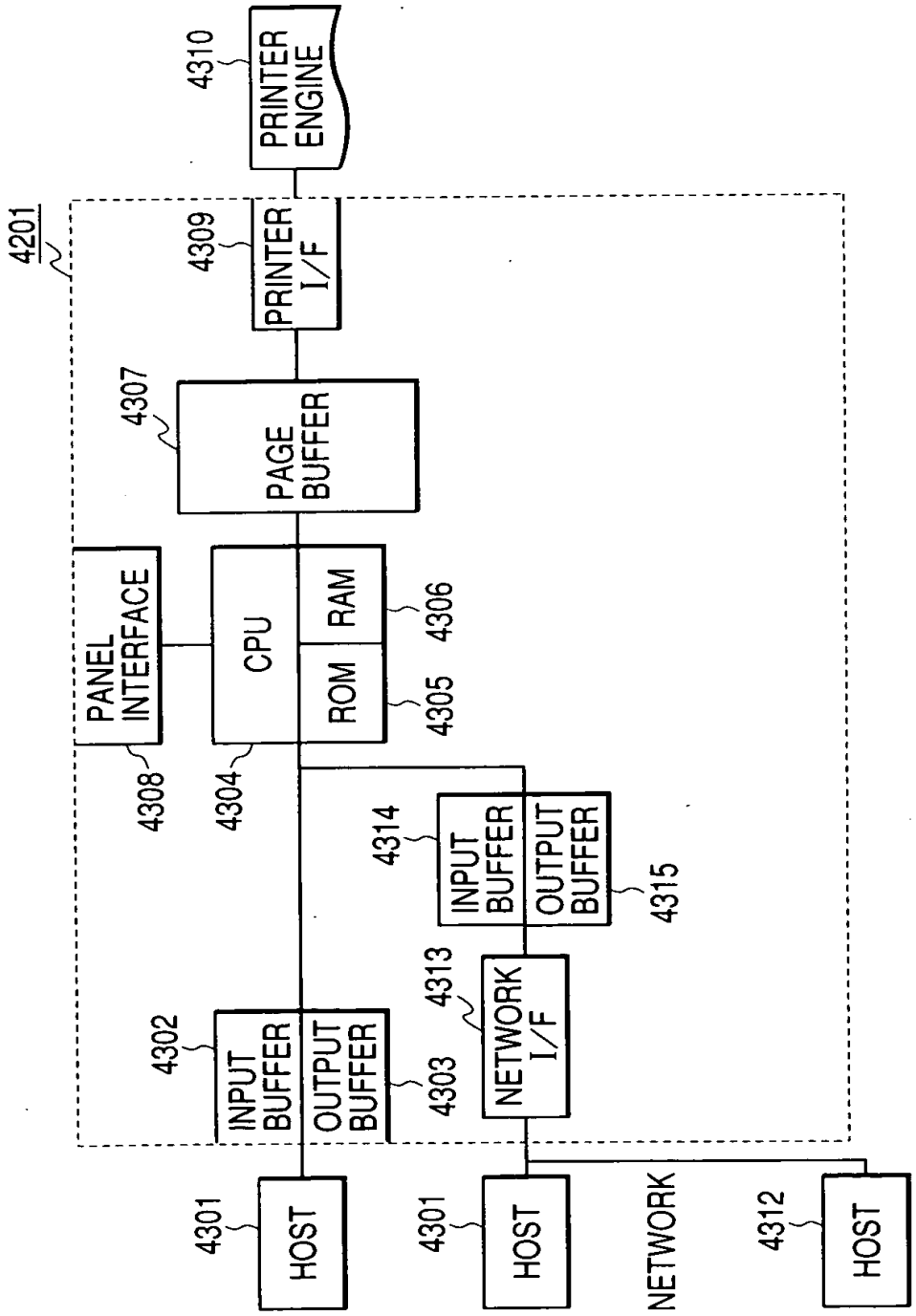

4310
PRINTER ENGINE
4201
4309
PRINTER I/F
4307
PAGE BUFFER
PANEL INTERFACE
CPU
RAM
ROM
4306
4305
4308
4304
4314
INPUT BUFFER
OUTPUT BUFFER
4315
4313
NETWORK I/F
4302
INPUT BUFFER
OUTPUT BUFFER
4303
4301
HOST
4301
HOST
NETWORK
4312
HOST

FIG. 44

4401 JOB ID	4402 STATUS	4403 PAGE BUFFER	4404 ANALYSIS INFORMATION	4405 OUTPUT INFORMATION	4406 NETWORK
1 (4407)	OUTPUTTING	100000		10000	
2 (4408)	WAITING FOR OUTPUT	180000			111.22.33.44
3 (4409)	ANALYZING		11000		111.22.33.47

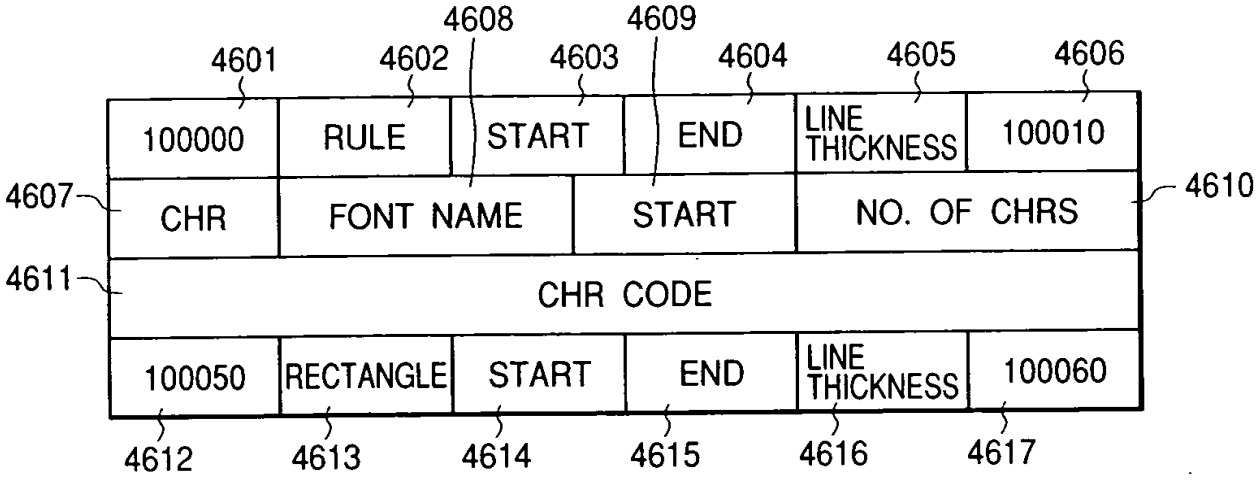
MANAGEMENT TABLE

FIG. 45

4501	4502	4503
ESC	PRO	OUTPUTTING/WAITING FOR OUTPUT/ ANALYZING

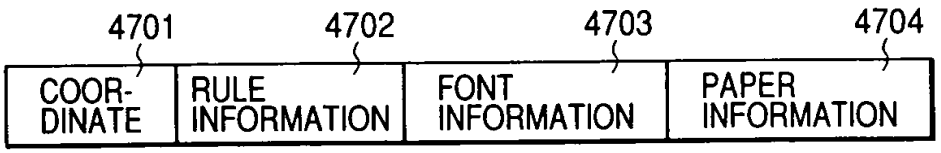
INTERRUPT COMMAND

FIG. 46



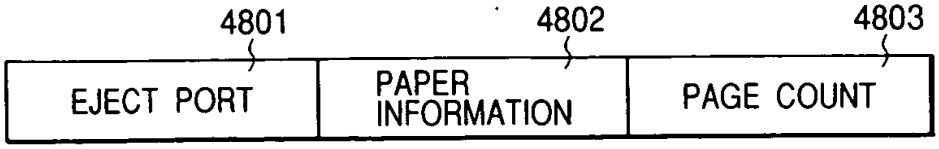
ANALYZED DATA IN PAGE BUFFER

FIG. 47



ANALYSIS INFORMATION

FIG. 48



OUTPUT INFORMATION

FIG. 49

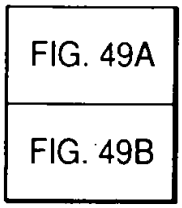


FIG. 49A

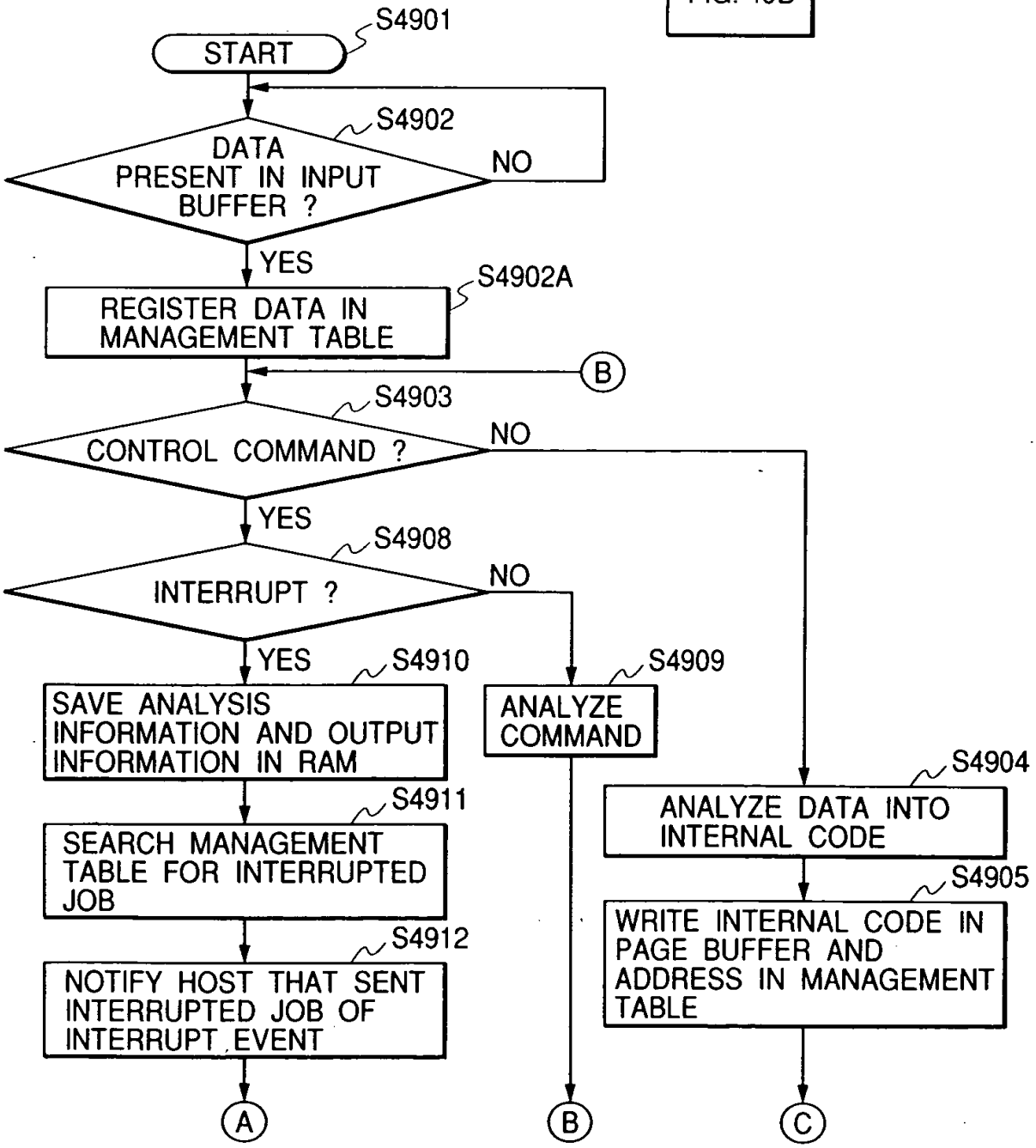


FIG. 49B

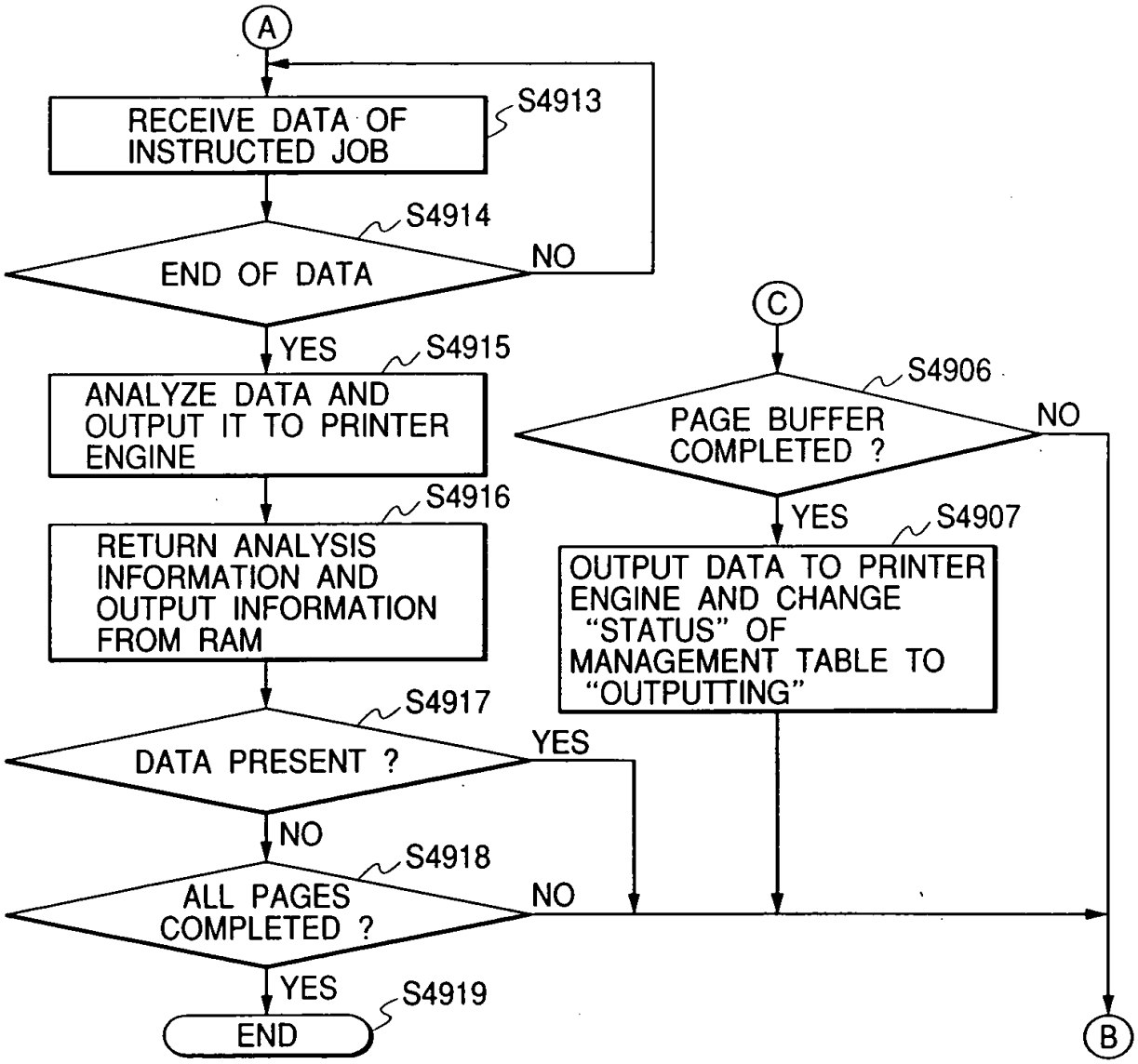

A
RECEIVE DATA OF INSTRUCTED JOB
S4913
S4914
END OF DATA
NO
YES
S4915
ANALYZE DATA AND OUTPUT IT TO PRINTER ENGINE
S4916
RETURN ANALYSIS INFORMATION AND OUTPUT INFORMATION FROM RAM
S4917
DATA PRESENT ?
YES
NO
S4918
ALL PAGES COMPLETED ?
NO
YES
S4919
END
C
S4906
PAGE BUFFER COMPLETED ?
NO
YES
S4907
OUTPUT DATA TO PRINTER ENGINE AND CHANGE "STATUS" OF MANAGEMENT TABLE TO "OUTPUTTING"
B

FIG. 50

INTERRUPT COMMAND

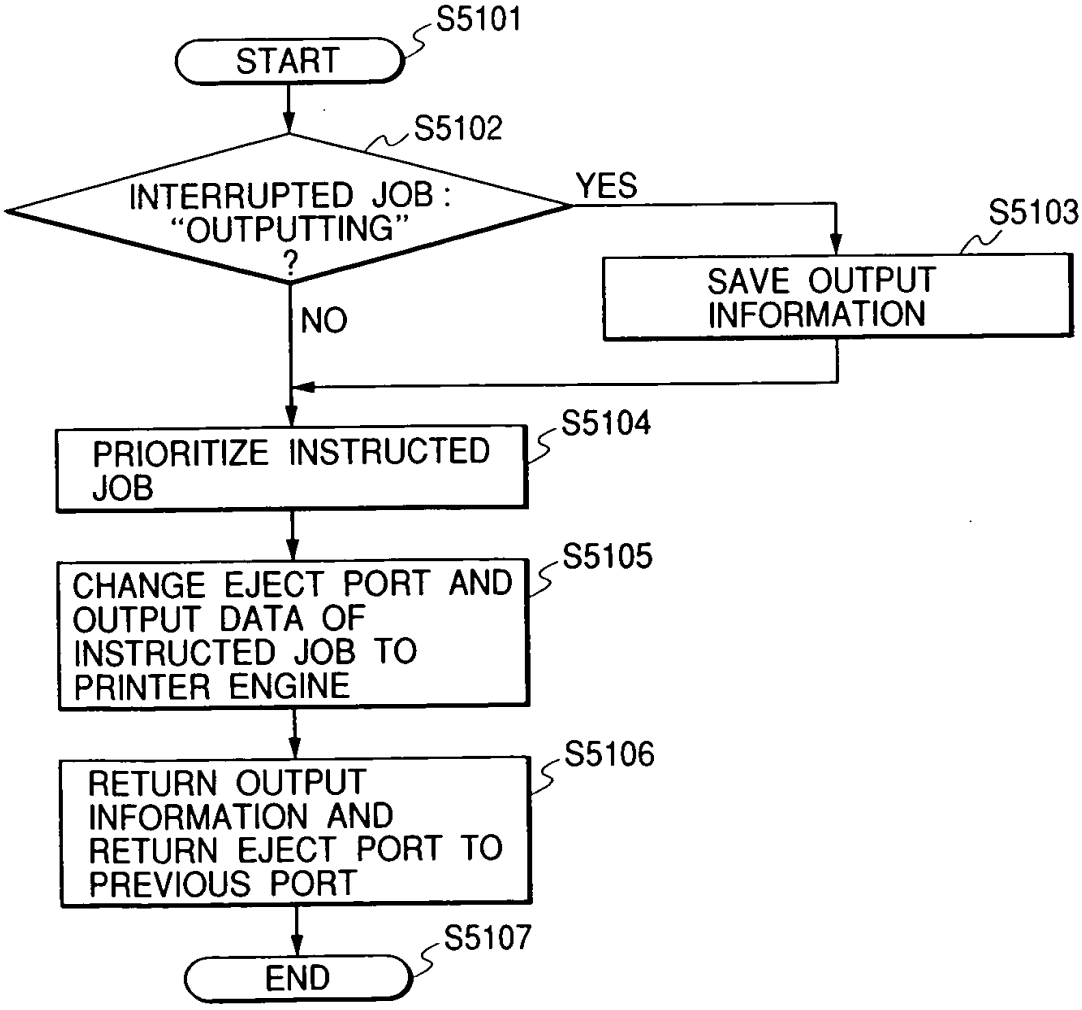



FIG. 51